A Lecture

ON

CERTAIN BACTERIAL INFECTIONS OF THE URINARY TRACT IN CHILDHOOD.

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GENTLEMEN,—Infections of the urinary tract in children, as in adults, may be classified as (1) descending infections, (2) ascending infections, and (3) infections by contiguity. The following remarks refer to the ascending and descending infections only.

Descending infection is synonymous with infection carried to the kidney by the blood-stream and is often termed "hæmatogenous" for this reason. In certain cases of this variety of infection the kidney presents evidence of very gross disease. Renal infarction such as may occur during the course of malignant endocarditis is an instance in point. Infective emboli may become impacted in the interlobular arteries, thrombosis and infarction result, organisms derived from the infected embolus invade the necrotic area and may make their appearance in the urine. The presence of a wedge-shaped infarct is not, however, infallible evidence that the infection is hæmatogenous, for infarcts of similar shape but limited to the pyramids or their extensions may arise as the result of infections of an ascending character. In the course of general tuberculosis, too, macroscopic lesions of the kidney occur. This hæmatogenous infection gives rise to miliary lesions which appear in the perivascular connective tissue and are visible to the naked eye, whilst microscopical examination may also reveal the occurrence of "excretion tuberculosis," the bacilli passing through the glomerular tufts and infecting the interior of the urinary tubules into which they are extruded. It seems that the excretion of organisms by the kidneys occurs in other diseases also, and that the process may give rise to undue irritability of the urinary tract and even to evident pyelitis or cystitis. As examples of this process the bacilluria of typhoid fever and the occurrence of pyelitis or of transitory incontinence of urine in such diseases as measles, scarlet fever, diphtheria, and small pox may be quoted. But it is a remarkable fact that in many of the cases of bacilluria associated with typhoid fever, scarlet fever, measles, and diphtheria the organism present has on proper investigation been found to be the bacillus coli communis.

There is, then, clinical evidence that the urinary tract may be the site of descending invasion. But it is important from the point of view of the prevention and treatment of urinary infections to inquire whether the common invasion in childhood is really of a descending character. Conheim suggested that in the event of a general bacterial invasion the body protected itself by the secretion of living germs through the intact kidney, thus relieving the system from the noxious organisms. A point of such importance inspired observations by many other observers and amongst them Professor C. S. Sherrington has shown that, although it is true that certain organisms when injected into the blood may escape in this way, yet the excretion is neither rapid nor immediate and, in the case of innocuous organisms, may not take place at all. The inference is that it is only after a certain amount of damage has been inflicted on the renal secreting tissues that the escape of organisms takes place. When blood is present in the urine after such experiments it may be assumed that gross damage has occurred. The presence of a quantity of albumin may have the same significance but even in the absence of hæmaturia or of albuminuria it cannot be assumed that some damage has not been inflicted on the kidney.

The matter appears to stand thus: The body can dispose of enormous numbers of injected bacilli without their appearing in the urine or other secretions. When they do appear the time of their appearance and the substances which appear with them lead to the presumption of renal damage. The quantities which appear in the urine are not in any way comparable to the quantities injected. Now clinically, in cases of bacilluria, the organisms appear in the urine, even when freshly voided, in enormous numbers. It is quite the exception to obtain any definite evidence of renal damage in the form of casts or blood and, as already stated, the bacilluria of typhoid fever, of scarlet fever, of measles, and of diphtheria has in many cases been proved to be a colon bacilluria. These facts lead to the suspicion that after all the common cause of bacilluria is due to an ascending infection, a suspicion which is corroborated by the sex incidence of the disease, for many more cases occur in females than in males. In some instances, too, the chronological order in which bladder and kidney suffer admits the same explanation.

Ascending infection.—In the adult the importance of ascending infection has long been recognised, but there can be no doubt that in childhood infections of this kind are much more common than ordinarily is supposed. When attention is seriously directed to the possibility of their occurrence a notable advance in preventive, if not in curative, treatment will have been made. The actual track of ascending urinary infections in the adult has been much discussed. Owing to the trivial character or even absence of lesions in the ureter some have supposed that the infection is carried either along the lymphatic channels which accompany the latter or directly through the chain of anastomising arteries or veins which link the bladder with the kidney, or even indirectly from the bladder to the kidney in the form of a true hæmatogenous infection. The lymphatic connexion between the bladder and the kidney appears to be neither free nor direct. Experimental injection of the connecting lymphatics is difficult and their exact pathological importance is as yet undetermined. There is also but little evidence to offer as to the part played by the anastomotic vascular links. The links in question consist of the chain which accompanies the ureter and also, in the female, of a chain formed by the anastomosis of the vesical, uterine, ovarian, and renal vessels. There are experiments which appear to show without doubt that an induced cystitis with injury to the bladder can infect the kidney through the general circulation, for after excision or ligature of one ureter the corresponding kidney has become converted into a pyonephrosis in consequence of artificial infection of the bladder.

But the ureter itself is commonly, and I believe rightly, looked upon as the highway of infection. It is generally acknowledged that ascending infection is to be expected where the ureter is blocked by a calculus, or where disease of its intravesical portion interferes with its efficient closure against reflux, or where there is obstruction to the outflow from the bladder. But the conditions here postulated are uncommon indeed in childhood, save in the case of boys with a tight prepuce, and, moreover, the infection is more common in girls. The chronological sequence of bladder infection and renal infection in some cases has left no doubt in my own mind that the colon bacillus can produce an ascending infection apart from obstruction to the descending urinary stream, a process which may be aided by its motility, as has often been suggested. Quite recently, too, it has been stated that ascending tuberculosis of the kidney can be experimentally produced by injecting an emulsion of the bacilli of bovine tuberculosis into the bladder without interrupting the flow of urine. The observations of Mr. C. J. Bond on the ascending currents in mucous canals are of interest in this connexion. He succeeded in demonstrating by the use of sterilised pigment that colouring matter deposited in the entrance of the urethra is carried by ascending currents into the bladder and that pigment deposited in the bladder is in like manner conveyed to the pelvis of the kidney. But it must be admitted that a normal condition of affairs did not obtain in his experiments, for they were carried out in patients in whom by reason of cystotomy or nephrectomy the normal downward flush of the urinary passages had been interfered with.

Nature and track of the common infection of childhood.—There is no doubt that in children the commonest infection of the urinary tract is that which is due to the colon bacillus. This has been the experience of all who have investigated this subject, and their conclusions I can, from my own observations, confirm. Although the disease may occur in males it is much more common in females, which is strong corroborative evidence of its ascending character, for the shortness of the female urethra and the proximity of its orifice to the anus render infection easy. In babies infection through the urethra may occur from soiled napkins or from the passage

of stools over the vulva. The presence of colon bacilli in the urine of infants suffering from diarrhœal diseases has been demonstrated by Trumpp. His proportions were two-thirds females and one-third males, a very significant preponderance of the females. In older children fæcal contamination of the vulva must often take place, and is occasionally very obvious in the case of children brought to the out-patient department of the hospital.

I have been surprised to find how often the colon bacillus is present in the urine of children suffering from thread-worms. Occasionally the ova of the parasites, and sometimes also the worms themselves, are found in the urine together with the bacilli. The coexistence of the bacilluria with the presence of the parasites in the bowel suggests that the worms may be in some way accountable for the urinary infection, either by the irritation and consequent scratching which they induce or possibly by acting as carriers of the bacilli from the anus to the vulva. It may be that the beneficial effect of circumcision in certain cases of incontinence of urine in the male is not so much due to the removal of mechanical irritation as to the abolition of a nidus of bacillary infection. I have also found that cases of colon cystitis and of pure bacilluria are much more common than cases in which the signs of pyelitis are present. This also appears to indicate that the infection is an ascending one. The facts bearing on ascending infection have recently been emphasised by H. Lenhartz who, investigating the cause and incidence of pyelitis in the adult, found that 66 out of 80 cases were due to invasion by the bacillus coli communis and that males were rarely infected. He attributed much importance to pregnancy, parturition, and menstruation in preparing the soil—conditions which naturally do not obtain in childhood.

There are certain characteristics of the colon bacillus which are noteworthy and which, in some degree, explain the clinical manifestations of the infection. It is an organism which, although it grows by preference in alkaline or just neutral media, can also grow in acid urine and is not easily got rid of by altering the urinary reaction. The acidity of urine is inimical to many other microbic infections, hence the bacillus coli is often found in pure culture. In the second place, it does not decompose urea and so give rise to ammoniacal products which have a destructive influence on urinary epithelium and usually co-exist with the more severe forms of purulent inflammation. Writers have remarked with surprise that in urinary infections due to the colon bacillus vulvo-vaginitis is seldom present; stress has also been laid on the fact that in colon cystitis and colon pyelitis the inflammation as a rule is of a very superficial or catarrhal nature. Lastly, the organism is motile, and so may, without the assistance of urinary stagnation, make its way into the pelvis of the kidney.

That acute ascending infections of the urinary tract may occur in adults suffering from gonorrhœa is undoubted. Whether these infections are due to the gonococcus or to the colon bacillus I am not in a position to state, but mention the fact of their occurrence because gonorrhœal vulvitis is not unknown in little girls, and it would be well if cases of ascending infection in this disease were properly investigated.

Clinical manifestations.—Infection of the urinary passages in childhood may manifest itself as pyelitis, cystitis, or incontinence of urine without obtrusive evidence of local inflammation.

Pyelitis may occur as a febrile affection with sudden onset, chills, and pyrexia. The temperature chart may show marked daily fluctuations or closely resemble that of pneumonia, or in some cases take the form of a succession of short febrile periods with intervening intervals in which the temperature is practically normal. The temperature may rise as high as 105° F. At the onset of the attack a certain degree of suppression of urine may occur, but may later on polyuria is the rule. The quantity, it is said, be increased to twice or thrice the normal, and frequent reflex micturition without evidence of cystitis is sometimes met with. When the course of the disease is protracted emaciation rapidly occurs. Enlargement of the spleen may often be detected and sweating may be pronounced. As a rule, the local manifestations of the disease are unilateral, and the right kidney is more likely to be affected than the left. Pain may be complained of and when present is generally subcostal and not lumbar in position. But the kidney may be found to be definitely tender and even enlarged in patients whose pain is trivial. The pain appears to be most severe in those in whom a certain degree of hydronephrosis has been induced by the disease. It is remarkable how quickly the renal enlargement may subside. The distension of the renal pelvis cannot be due to a twisting of the kidney, for undue renal mobility is extremely rare in infants and young children. It is possible that inflammatory swelling of the mucous membrane of the pelvis, at its junction with the ureter, is the cause of the condition, for at this point the passage is naturally constricted. I believe that pyelitis occasionally occurs in a much milder form, characterised by very transitory attacks of subcostal pain with little or no fever. My reason for this belief is that more than once I have known such attacks of pain to occur in patients with colon bacilluria who were under treatment for incontinence of urine.

Slight vulvitis is present in some cases of pyelitis and in some there have occurred symptoms of cystitis, in the form of painful, frequent micturition and hypogastric tenderness, before the actual onset of the pyelitis. The urine is usually acid and slightly turbid or opalescent. A slight sediment falls; it consists of a few pus cells. In the more acute cases some erythrocytes and even a few hyaline casts may be seen. The presence of many tube casts indicates coincident inflammation of the kidney. The amount of albumin is slight and a certain amount of nucleo-proteid can be demonstrated by suitable tests. The turbidity of the specimen does not clear up with boiling or with acids and persists after repeated filtering. It is due to the presence of bacilli which almost invariably turn out to be the common colon organism. It is possible that repeated attacks of pyelitis of this nature may account for some of the cases of hydro- and pyo-nephrosis which are found in adults and for which no obvious cause is present.

The possibility of the presence of pyelitis should always be borne in mind when dealing with cases of obscure fever in childhood, whether of a sustained, remittent, or relapsing character. The occurrence of shivering or of rigors should especially direct attention to the urine and urinary tract. More than one specimen of urine should be examined, as it is not every portion obtained which shows the characteristic changes. The fever is sometimes erroneously attributed to gastro-intestinal disturbance, to deep-seated pneumonia, or even to tuberculosis. In malarial districts malaria may be closely simulated.

Cystitis of a more or less acute character is not at all uncommon in childhood. The onset as a rule is sudden and not attributed to any definite cause; but in some instances, as in adults, the symptoms appear to follow exposure to cold and in a few cases, of which I have met with instances, the attack has followed trivial injury to the perineum, such as, for instance, may be inflicted by falling astride a chair. In a severe case the temperature may rise to 103° or more. Micturition is frequent and painful. Nocturnal incontinence of urine usually sets in. The child screams during the passage of urine and attempts to evade the act, often tightly crossing the legs. Pain is referred to the hypogastric region, the fronts of the thighs, and sometimes to the perineum. These regions may be decidedly tender. In some cases the act of micturition is accompanied by distinct rigors. A little blood may escape with the urine and in one of my patients the bleeding was so obvious that the mother volunteered the statement that the clothes were stained just as if the child (a little girl) were unwell.

Just as with pyelitis, milder attacks occur in which there is no fever and the pain on micturition and tenderness of the bladder are very slight. The increased frequency of passing urine is the chief feature of these cases. The urine is faintly acid or neutral; it is important to recognise that the urine may remain acid both in pyelitis and cystitis, especially when the infection is due to the colon bacillus. It is always turbid or opalescent; if much blood is present it may be smoky. The amount of albumin is variable; sometimes it is considerable and may lead to a fear that the kidney is involved, but nevertheless entirely clear up. As in pyelitis and other conditions some nucleo-proteid may be present. The sediment contains pus cells, sometimes blood corpuscles and epithelium; in very acute cases membranous flakes may occur. The colon bacillus is almost invariably found. Needless to say, a proper bacteriological examination is essential for correct diagnosis. Abrupt stoppage of the stream during micturition should always suggest the presence of stone and lead to further examination by bimanual palpation of the bladder, x ray examination, and sounding. The possibility

of the stone being in the ureter or impacted in the commencement of the urethra should not be overlooked. The stream is sometimes stopped by reason of the intense pain in cystitis, but not abruptly, save possibly in the cases where large membranous shreds are present. Frequency of micturition occurs both in pyelitis and cystitis, but actual pain on micturition with tenderness above the pubes and in the perineum point to involvement of the urinary bladder. No differential value appears to belong either to the characters of the epithelium or the amount of albumin present.

Incontinence of urine, as is well known, may be associated with bacilluria, and again the organism present is almost invariably the bacillus coli communis. Some of the most inveterate cases of bed-wetting with which the physician is called to deal fall into this group, whilst, on the other hand, some of the cases in which the same organism occurs are quite mild and transitory, yielding readily to the simplest treatment. That in some instances the incontinence may greatly improve, although the organisms are still present, is also noteworthy. In inveterate cases the urine is always turbid from the presence of myriads of bacilli. In a few cases the urine is not decidedly opalescent but colon bacilli are found in large numbers in the somewhat flocculent cloud which quickly settles in the urine glass. Increase in quantity of the urine has generally attracted the attention of the mother and is usually remarked upon. The incontinence at first is nocturnal only and the bed may be wetted two or three times each night. In some instances diurnal incontinence sooner or later ensues; in a few of my patients it has assumed that form in which urine escapes on coughing, laughing, or other physical exertion.

The reaction of the urine is generally faintly acid, sometimes neutral, never, in my experience, alkaline. A mere trace of albumin may be present by the boiling test. The centrifugalised sediment consists of a few pus cells and many bacilli. Casts of any sort are absent and the presence of urinary epithelium is quite the exception. Sometimes a few oxalate crystals are noted. I have once or twice met with the decomposition, with production of a curious odour described as "fishy," which is attributed by some authors to colon infection. In incontinence with marked bacilluria it is exceptional to obtain a history pointing definitely to cystitis or pyelitis but slight vulvitis is present in some instances. Exceptionally a history of suprapubic pain at some stage of the affection may be elicited and some of my patients have had definite attacks of slight subcostal pain whilst under treatment, which may indicate the presence of slight pyelitis. For some time past I have been in the habit of testing the urine of these cases for nucleo-proteid, the presence of which is assumed to indicate some irritation of the urinary tract. For this purpose Ott's method has been adopted and the reaction is often well marked, but a similar reaction occurs in the urine of many other children who have no bacilluria.

There is a curious resemblance amongst most of the patients who suffer from this form of incontinence—they are shy and nervous and frequently get the reputation of being stupid or sullen. This mental condition is much improved when the disease yields to treatment. Headaches are frequent, the tongue generally is coated, and the bowels are irregular in their action. A history of attacks of diarrhœa is not uncommon, but I have not been able to satisfy myself as to the condition of "coprostasis" on which some authors lay so much stress. It is true that in some cases the abdomen is somewhat distended and tympanitic but this may be seen even when the bowels are acting quite regularly.

The course of the disease appears to be not altogether afebrile. Slight elevation of temperature at night, rarely above 100° F., may occur for weeks at a time. The presence of worms together with bacilluria is not uncommon and, as already suggested, the connexion between the two conditions may possibly be one of cause and effect. The evidence of mothers as to the presence or absence of worms is frequently unreliable and in several instances their presence, though unsuspected, has been proved by the discovery of ova or even of worms themselves in the urine.

Prognosis.—The cystitis of childhood when caused by the colon bacillus calls for a guarded prognosis. A certain number of cases, particularly those with acute onset and marked bladder symptoms, clear up under the simplest medicinal and dietetic treatment. There are others, however, in which the local symptoms may be less pronounced, which drag on with intermissions and exacerbations, sometimes for months. Pyelitis due to the colon bacillus appears to be much less common than cystitis. My cases have been few in number and short in duration but if any parallel exists with similar cases in the adult the affection should vary considerably both in duration and intensity. The cases of incontinence of urine with which the colon bacillus is associated also vary very widely. In some cases the symptoms are transitory and clear up without any special treatment; others, as already indicated, resist all methods of treatment with the greatest obstinacy. The marked variations in the clinical course of these infections must be due either to variations in the virulence of the infecting organism or, as I believe is more probable, to variations in the resisting power of different individuals.

Treatment.—If the theory of ascending infection be correct the importance of frequent bathing and of the avoidance of urethral contamination from the anus as preventive measures cannot be overrated. All cases of vulvitis should be recognised promptly and treated. The milder cases of cystitis, pyelitis, and incontinence of urine do well with the ordinary treatment by full doses of citrate of potassium combined with the sedatives of the belladonna group. In the treatment of severe cases of incontinence of urine, even though colon bacilluria is associated, the first care should be to determine the presence or absence of thread-worms. Careful examination of the stools and urine is necessary for this purpose. The ova and embryos should be sought for, the former being easily recognised by their asymmetry, being flattened on one side. I do not propose to discuss the treatment of these parasites beyond saying that when injections are used for this purpose the proper time to give them is not necessarily at night or morning but *after the bowels have acted.* Belladonna has proved a very disappointing drug in inveterate cases. I have not hesitated to push it until delirium was induced and even then it has failed. Neither have I been able to obtain any definite results with drugs of the formalin type, such as hexamethylene tetramine (urotropine) or its methylene citrate (helmitol) or its benzoyl derivative (hetraline). These drugs, although very effectual against the typhoid organism, do not appear to influence the colon bacillus. The results obtained with benzoate of ammonium, salicylate of sodium, and boric acid are no more encouraging. The latter in particular plays havoc with the appetite and soon induces nausea.

With a view to test the theory that the bacillary infection is hæmatogenous and perhaps due to coprostasis, cases were treated for prolonged periods with mistura olei ricini (B.P.) and also with calomel to the point of producing slight stomatitis. No improvement could be ascertained. Salol also failed. In one case of colon bacilluria and incontinence, after internal medication had failed, it was accidentally discovered that the use of boric powder to the vulva always stopped the incontinence. The same treatment was not successful in other cases.

Finally, with the coöperation of Mr. L. S. Dudgeon the effect of anti-bacillus coli serum was tried. In one patient with inveterate colon bacilluria and incontinence, where the condition had resisted all treatment for 12 months, admission to hospital and three injections of 25 cubic centimetres of the serum stopped the incontinence although the bacilluria persisted in some degree. This patient relapsed, to the extent of one incontinence a week, a month after discharge, but she is much better than before the treatment was adopted. At one period she suffered from thread-worms. In another patient treatment with the serum both by subcutaneous injection and by rectum failed after a prolonged trial. Dr. M. A. Cassidy carried out a series of vaccinations with no better result. On washing out the bladder with saline solution and leaving in 25 cubic centimetres of the serum daily for seven days the urine cleared in an extraordinary way and cultures were only with difficulty obtained from it. But the incontinence persisted and a few days after discontinuance of the treatment the bacilluria was as pronounced as ever. In the same patient irrigation with boric solution and also with quinine had practically no effect. Thread-worm embryos were found on microscopical examination of the fæces although their presence could not be determined in any other way. The case is still under observation.

My acknowledgments are due to Mr. Dudgeon, the superintendent of the clinical laboratory at St. Thomas's Hospital, and also to Dr. P. N. Panton for the ungrudging assistance they have afforded me in the investigation of the bacteriology of a long series of cases on which this lecture was based.

Some Remarks ON THE INFECTIVITY OF CANCER.*

Being an Address delivered at a Meeting of the East Yorks Division of the British Medical Association at Hull on Nov. 15th, 1907.

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MR. PRESIDENT AND GENTLEMEN,—The problem, "What is Cancer?" is hoary with antiquity, yet, nevertheless, it is of perennial interest. On two previous occasions I have had the honour of addressing you upon this subject; once on its "Etiology,"[1] and again on its origin by "Exogenesis."[2] To-night I desire to direct your attention to certain points to which I have not previously referred, and to others already mentioned, but which I wish to enlarge upon and emphasise. That the importance of the problem is vital will be admitted by all, for, although many other diseases are just as incurable, and exact even a greater tale of victims than cancer does, there is no disease which is so universally dreaded, or causes more mental distress, in addition to physical suffering. This importance, moreover, becomes still greater when it is realised that the disease is becoming more and more widely diffused—that it is unquestionably increasing.

THE INCREASE OF CANCER.

An appeal to statistics leaves it in doubt whether the percentage ratio is or is not increasing, although the consensus of expert opinion is in favour of increase. No doubt the percentage ratio is affected by the greater accuracy in diagnosis and by the fact that the average duration of life is markedly increased, but it must not be overlooked that many deaths have been certified as due to malignant disease which have not been confirmed by *sectio cadaveris*. Even, however, if the percentage ratio is not increasing but remains stationary, it is still evident that cases of cancer must increase in number, *pari passu* with the increase in population. When, therefore, the population of a given place doubles itself, as it does in x years (Vienna, e.g., has doubled itself in 25 years), then the number of cases of cancer must likewise, at the end of this period, be double what it was at the beginning.

Dr. S. Monckton Copeman states[3] in the Guthrie lecture, delivered in 1907 at Westminster Hospital, presumably from reliable data, that of individuals at present living above the age of 35 years, 1 in 8 women and 1 in 12 men will eventually die from cancer. This means that cancer will decimate those of an age above 35 years—truly an appalling prospect!

I regret that I am able to corroborate this estimate of Dr. Copeman from statistics supplied by my own practice. During the last five years there have been 389 deaths certified, of which 44 have been due to cancer (17 males and 27 females), and this yields an annual average of 11·3 per cent. of deaths due to malignant disease. The actual figures are:—

Due to Cancer.

1903	66 deaths	5 (4 females, 1 male)	7·5	per cent.
1904	78 ,, ...	11 (6 females, 5 males)	14·1	,,
1905	99 ,, ...	8 (5 females, 3 males)	8·0	,,
1906	72 ,, ...	7 (6 females, 1 male)	9·7	,,
1907	74 ,, ...	13 (6 females, 7 males)	17·56	,,

Age.

Between 40 and 50 years...	2	Between 80 and 90 years...	5
,, 50 ,, 60 ,, ...	11	Above 90 years	1
,, 60 ,, 70 ,, ...	12		
,, 70 ,, 80 ,, ...	13	Total	44

Youngest, 48 years; oldest, 94 years.

Region.

Internal (mouth—rectum)	24
Breast	9
Genito-urinary	6
Intracranial	1
Face and groin	4
Total	44

Under observation, 5.

* The superior figures refer to the bibliography at the end.

CANCER HYPOTHESES.

Since the *causa causans* of cancer has not yet been demonstrated, it is not remarkable that many causes should have been suggested and many hypotheses propounded. Indeed, such causes and hypotheses are countless, and while their attempted recapitulation would doubtless be of great interest such would be but vain iteration. Suffice it to say that all these alleged causes and suggested hypotheses crystallise out into two classes: (1) *intrinsic*, of which the number is "legion"; and (2) *extrinsic*, of which there is but one. *Autogenesis* or *Exogenesis?* "that is the question." No doubt the calm, philosophic, and scientific attitude to maintain upon a subject which cannot be proved to demonstration is that of "the open mind"; but even the calmest, unless he is a disinterested Gallio, must find it hard to remain in a state of passive imperturbability when so much is at stake. Hence it is that there are warm advocates of both these views. The exponents of exogenesis believe that the evidence in favour of the extrinsic origin of cancer is overwhelming, and that this hypothesis will satisfactorily account for the incidence of cancer in every case, and they acknowledge only one possible cause—viz., parasitism. The believers in autogenesis, on the other hand, chiefly maintain a negative attitude, denying the possibility of an extrinsic cause, but fail to formulate any practicable hypothesis which will explain the origin of the disease in every case. They suggest theory after theory, continually shifting their ground, and nohow can they suggest satisfactorily why cancer should arise, apparently *de novo*, in any single case.

Again, the supporters of exogenesis hold that if cancer has an intrinsic origin—e.g., "running to seed"—it would not only be very much more prevalent than it is, but that few, if any, could escape from it. They also hold that an extrinsic origin would satisfactorily account for the proportion of individuals attacked, and believe that the widespread occurrence of the disease among vertebrates indicates the omnipresence of a specific parasite, and that those who are attacked are simply those whose vulnerability, from whatever cause, has permitted its access to the host and favoured its development. The opponents of exogenesis urge that the extrinsic origin of cancer is impossible because it is not entirely analogous to any known infectious disease. The reply to this is that it is most unreasonable and illogical to presume that pathological processes can be in any way limited or even influenced by analogy; and, furthermore, that analogy is quite incapable of proving anything. At the most, analogy can suggest mere probability, and is, after all, only a very convenient method of comparison between processes which resemble one another.

The following may be cited as a concrete example of the futility of trusting to analogy to establish a conclusion. When Farmer, Moore, and Walker announced their interesting discovery that the karyokinesis of the cells forming a malignant neoplasm is heterotype in character, and that the karyokinesis of the cells of normal reproductive tissue is also heterotype, the director of the Imperial Cancer Research Institute[4] hastened to emit the extraordinary declaration, *ex cathedrâ*, that "malignant new growths were virtually reproductive tissue arising in abnormal situations"!

Now, which hypothesis is most probably right—autogenesis or exogenesis? It is difficult, and even impracticable, to discuss the former, since the various intrinsic hypotheses are too numerous and too elusive, while their very multiplicity testifies to their inadequacy; but exogenesis, having only one string to its bow—viz., parasitism—can be considered. If further information regarding these numerous intrinsic hypotheses and suggested causes of cancer is desired, I would refer you to a work recently written by Dr. Jacob Wolff of Jena, entitled "Die Lehre von der Krebskrankheit von den aeltesten Zeiten bis Gegenwart" ("The History of Cancer from Ancient Times to the Present"). It was published in 1907 by Gustav Fischer and consists of 747 octavo pages.

Since cancer is admittedly a specific disease which runs a definite course of attack, extension by dissemination similar to that of many other diseases, such as tubercle, syphilis, malignant endocarditis, &c., constitutional intoxication, and ending only in death, believers in exogenesis cannot admit the possibility of any somatic cell spontaneously developing specific malevolent action. They are constrained to believe that a specific disease can no more originate without the presence of a specific morbific agent than that parthenogenesis can occur in the vertebrata. This specific agent, they consider, cannot be other than an extrinsic parasite, either a microphyte or a microzoön.

PARASITISM.

It may truly be said of parasitism what Shakespeare[5] says of Cleopatra, by the mouth of Enobarbus, "Age cannot wither her, nor custom stale her infinite variety." The universality of parasitism is quaintly but concisely expressed in the quotation from Professor Russell Lowell :—

> "Great fleas have little fleas
> Upon their backs to bite 'em;
> And little fleas have lesser fleas,
> And so *ad infinitum*."

What is true of the pulex irritans is equally true of all creation. The diseases which we already know to be caused by parasites are very numerous, and so many more are becoming suspected of a like origin that presently one will be driven to conclude that all the ills to which flesh is heir, excepting accidents, are due to parasitism. Organic chemistry has been defined as "The continued history of carbon." It appears that we shall soon be justified in defining all disease (apart from accidents) as "The continued history of parasitism."

IS CANCER INFECTIOUS?

If cancer is caused by a parasite it comes under the designation of "infectious." *Is cancer infectious?* Before answering this question, which is the theme of this essay, it were well to define what I mean by the terms "infection" and "infectivity." "Infection" is a comprehensive term and may be defined as the transmission of a disease from one individual to another, directly or indirectly, by the agency of a specific micro-organism, either a bacterium or a protozoön. *I believe cancer to be thus transmissible.* Infection varies greatly in degree, and cancer is evidently not infectious to the same extent as many other diseases—e.g., variola. It is probably acquired much as enterica is by introduction through the mouth; or as syphilis is, by contact; or as tetanus is, by access of the germ to any vulnerable part; or it may be through the agency of an intermediate host, as is the case in malaria or trypanosomiasis.

It has long been maintained, and many concrete instances have been quoted to prove, that cancer is transmissible by direct contact, as in "cancer-à deux," of which "coition-cancer" is an example. Such transmission, however, has been generally denied and accounted for by fortuitous coincidence; but as transmission by implantation from one lower animal to another of the same species has been successful, and freely admitted to be so by all, the transmission in the case of "cancer-à-deux" has had reluctantly to be admitted as at least possible. This transmission has been designated "transplantation" and not admitted to be the successful and genuine inoculation of a specific disease. Now, if the "transplanted" cancerous tissue resembled a skin graft, always remaining local and forming no tumour, or if it merely continued to grow locally by proliferation without the usual metastatic dissemination and constitutional intoxication, and never caused death, then the term "transplantation" might be justified; but when the characteristic evolution of malignant disease follows, terminating the life of the invaded host, one can only regard the case as one of genuine inoculation of a specific disease by a specific agent—i.e., that it is the result of true "infection."

In connexion with the successful inoculation of cancer in the lower animals of the same species, and also as bearing on the question of "cancer houses and rooms," an interesting communication was made by Dr. Gaylord of Buffalo entitled, "Evidences that Infected Cages are the Source of Spontaneous Cancer developing among small Caged Animals."[6] I regret that the time at my disposal is too short to permit of reference to this paper at length, but I am sure you will find it well worthy of perusal. Dr. Gaylord first refers to the endemic occurrence of cancer of the thyroid in brook trout hatcheries in Germany, recorded by Pick. Pick states that his investigations show that certain hatcheries are entirely free from this affection and that where the fish are affected the disease is confined to individual tanks or pools in which the fish are kept; that wild fish introduced into those ponds to replenish the stock acquire the disease, and this, to his mind, eliminates heredity as a factor in the development of the disease. The nature of the affection is true carcinoma, and he concludes that this endemic occurrence of cancer among trout in certain tanks only indicates that the water of these tanks contains the agent which is the cause of the disease. Dr. Gaylord then proceeds to narrate many instances of cancer occurring in rats which developed the disease after occupation of cages previously occupied by other rats suffering from cancer. These instances are quoted by several observers, both medical and lay, in the latter case by the man who supplied rats to the laboratory for experimental purposes. It was found that when the infected cages were thoroughly disinfected no further infection occurred.

AUTO-INOCULATION OF CANCER.

To my mind, the strongest argument which can be adduced in favour of the exogenesis of cancer is one of its most distinguishing characteristics—viz., its undeviating method of growth and dissemination by proliferation and metastasis and auto-inoculation. Although cancer is unquestionably purely local at the outset, unfortunately it does not long remain so. Indeed, it would be completely under the control of the surgeon's knife and would lose all its terrors were it not for the fatal metastases which are invariably formed and that with a startling rapidity which is not sufficiently realised.

Mr. C. B. Lockwood[7] has drawn attention to this rapid extension of the disease in a communication entitled, "Carcinoma of the Breast and its Spread into the Lymphatics." He points out that in malignant growths of organs which have no capsule—e.g., the mamma, tongue, or pharynx—hardly any interval of time exists between the onset of the disease and its spread into the lymphatics. He says, "In the smallest carcinoma of the breast that I have seen the neighbouring lymphatics were already cancerous." It is this inevitable and rapid metastasis which is responsible for the equally inevitable failure of the great majority of operations for the removal of malignant neoplasms.

Mr. H. T. Butlin,[8] in his recent address in surgery at the annual meeting of the British Medical Association in 1907, on "The Contagion of Cancer in Human Beings and Auto-inoculation," says: "The key to the problem of communicability of cancer in human beings must surely lie in the study of auto-inoculation. If auto-inoculation can be proved on such evidence as would be admitted in a court of law there is a *primâ facie* case for contagion." He then goes on to say: "If the proof of auto-inoculation falls through from the lack of sufficient evidence it is no longer worth while to pursue the study of contagion from individual to individual." Granted, but auto-inoculation of cancer requires no proof. Unfortunately for mankind it is indisputable; it is a marked and only too self-evident characteristic feature of the malady. Every metastasis is a true auto-inoculation. So, also, is every so-called "recurrence." There is obviously no such process as recurrence. That which has been removed cannot recur, but what has been *left behind* continues to grow. Worse still, what has been set free from divided lymphatics and the tumour itself by the surgeon's knife, and what that infected knife has itself inoculated in and about the wound infallibly grows also. Mr. Butlin's conception of "auto-inoculation" appears to be a very limited one, applying only to the inoculation of an adjacent healthy surface by an affected one. Although it is well known that this auto-inoculation of adjacent structures not infrequently happens its absence or presence is merely of academic interest. Its presence is confirmatory, but its absence cannot in the slightest degree invalidate the obvious fact that auto-inoculation is one of the most marked characteristics of cancer. Mr. Butlin's "key" is therefore ready to his hand, for the condition he considers necessary to establish a *primâ facie* case for contagion is, only too clearly, already in evidence.

Mr. Butlin further says: "Experiment has proved that successfully implanted carcinoma invariably presents, both in the graft and its metastases, the characters of the carcinoma from which it was implanted"; also that, "no transformation has yet been observed of one variety into another variety." Then, as a corollary to this, he adds, "all cases of reputed contagion of cancer, in which the disease is not of the same variety, must be unhesitatingly rejected." With regard to his first point, that grafts and their metastases always present the same characters as the parent carcinoma, it could not possibly be otherwise. It is another characteristic of cancer that "breeds true," and every metastasis, wherever situated, is an actual fragment, or graft, of the original neoplasm, and a cancerous graft implanted successfully in another individual is, to all intents and purposes, a metastasis of the tumour supplying the graft. Consequently, all implanted carcinoma grafts and their metastases must be of the same variety as the original growth. As regards the second point, Mr. Butlin must be unaware of the

recent experiments of Ehrlich and Apolant[9] which have demonstrated beyond doubt that even a carcinoma can, under given conditions, lead to the development of a sarcoma in connective tissue immediately adjacent to it. If, then, a carcinoma can give origin to a sarcoma, it is obviously even more probable for one variety of carcinoma to originate another variety of carcinoma. It does not, therefore, appear necessary, after all, to reject the cases of reputed contagion in which the disease is not of the same variety. Farther on I shall endeavour to show that any one variety of malignant neoplasm may originate any other variety. The reason for Mr. Butlin's rejection of these cases is entirely consistent with his belief, which is that, although he considers cancer to be a parasitic disease, he is not apparently able to admit the logical sequitur that a specific parasitic disease must be necessarily caused by a specific extrinsic parasite. In the Bradshaw lecture[10] delivered by him in 1905 Mr. Butlin maintains that "cancer is a parasitic disease," but that the "carcinoma cell" itself is the parasite and "acts as an independent organism like many a protozoon."

IS THE CANCER CELL ITSELF THE PARASITE?

Imprimis, there is no such entity as a special "carcinoma cell." Professor D. J. Hamilton[11] of the University of Aberdeen says, with reference to carcinomata: "The old notion that there was a special cell indicative of cancer is erroneous. The only point which is typical about the cells of the tumour is that they are always epithelial; they have no constant morphological features beyond this." The elements of any malignant neoplasm are simply ordinary somatic cells which have undergone abnormal, exuberant proliferation under a specific stimulus. Transmitted by the lymphatics and blood-vessels, or implanted deliberately by artificial means, these cells certainly *appear* to act like independent parasites, but they act in this manner not voluntarily but only by virtue of the intracellular malignant stimulus which is clearly the micro-parasite.

It is impossible for the "carcinoma cell" to be the true parasite.

Let it be supposed for a moment that the "carcinoma cell" could be the parasite, then—1. There must have been an original neoplasm for it to come from. How, then, did this original growth arise? Certainly not from any pre-existing "carcinoma cell," since "*ex nihilo nihil fit.*" 2. All cases of cancer would also of necessity be due to direct contact. 3. All cases of cancer would be of only one variety—viz., the same variety as the original neoplasm from which the "carcinoma cell" emanated. Now, we know that comparatively few cases of cancer are due to direct contact; so few, indeed, that they are not generally accepted as genuine, and the "cell parasite" would account for them only. The great majority of malignant neoplasms arise apparently spontaneously and sporadically; also it is a characteristic of cancer that its variety is very great. It is obvious that the origin of cancer and its great variety must be explained in some other way than by the direct implantation of a "carcinoma cell" or by the preposterous suggestion that any somatic cell by any intrinsic stimulus can possibly develop *de novo* a *specific* disease such as cancer. We may as well be asked to believe that tuberculosis, for example, can be originated by the agency of an intrinsic stimulus. I beg to submit that the living implanted cell which may be the starting point of any malignant neoplasm must have been derived from a pre-existing neoplasm, and that its malignant influence is due to an intracellular micro-parasite endowed with extraordinary and most malevolent powers. It is this intracellular entity which is the "*deus ex machinâ*" or, as it might be more appropriately designated, the "*diabolus ex machinâ*," of Mr. Butlin's "carcinoma-cell parasite," and this micro-parasite can, and does, exist independently of any cell. It alone is responsible for the original of all neoplasmata.

With regard to his "carcinoma cell," Mr. Butlin states[12] that it exhibits a singular tenacity of life, for such cells have been kept for many days at a temperature below 27° F. or have been placed in sterilised glass flasks and sent across the sea by post and yet have in each case been inoculated with as good a result as if they had just been transplanted from one individual to another. Later, however, he adds that all experiments made with the object of cultivating the "carcinoma cell" outside the body of the host have resulted in failure, and that Ballance and Shattock have reported that they have been unsuccessful even in keeping these cells alive outside the host. These statements are contradictory. It is impossible for living cells of any kind, malignant or otherwise, to retain their vitality for any length of time after removal from their natural environment. Everyone knows that any cells can, by sterilisation, be preserved from decomposition for an indefinite time, but this preservation is not synonymous with vitality. How, then, can these conflicting statements be reconciled, and how was it that these dislocated "carcinoma cells" were successful in inoculating fresh hosts as alleged? Their success was clearly due to the vitality of the intracellular parasite itself and not of the encapsuling cells. The vitality of the intracellular parasite is of paramount importance for the perpetuation of its species and is very great, whereas the vitality of the dislocated "carcinoma cells" is of very brief duration and of only secondary importance. Although the cell itself is dead it can still originate a neoplasm by virtue of the living intracellular parasite, but the resulting neoplasm is, as I shall presently show, of a different type from that originated by a living cell.

CLASSIFICATION OF NEOPLASMATA.

All neoplasms may be divided, clinically, into: (1) benign; and (2) malignant.

The *benign* are, for the most part, simply local hypertrophies of normal tissue and remain so unless they become infected like any other normal tissue, in favourable circumstances, and they do not form metastases. These benign tumours do not require any specific stimulus to originate them, simple stimulus of a mechanical nature being quite sufficient in many cases for the purpose. They are comparable to the pearl of an oyster which is simply the deposit of a normal substance around a foreign body.

Malignant neoplasms are divided into: (1) epitheliomata; and (2) sarcomata. Epitheliomata arise from epithelium, originally derived from the epiblast and hypoblast. They disseminate themselves chiefly by the lymphatics but also, to some extent, by the blood-vessels. Sarcomata arise from connective tissue, originally derived from the mesoblast. They, on the other hand, chiefly utilise the blood-vessels for propagation but they also utilise the lymphatics. Malignant neoplasms cannot arise without the agency of a definite specific stimulus. These two great classes are further subdivided into very many varieties as regards structure but in all other essentials they are practically the same in each case. This great variety is, simply and entirely, due to the anatomical diversity of the tissues in which they occur and their environment. As Professor Hamilton[11] points out, all such subdivisions as osteoid, villous, colloid, chondroid, encephaloid, &c., are "useless and misleading."

With regard to their method of origin in the tissues, malignant neoplasms are of two distinct types: (1) primary; and (2) secondary. The primary are those formed by the proliferation of the cells of the *local* tissue invaded by the parasite itself. When the parasite is in a *free* state or encapsuled in a *dead* cell thrown off from the surface of a neoplasm (which practically amounts to the same thing, for a cell devoid of vitality is obviously incapable of proliferating and so originating a tumour composed of its own elements), and when it gains access to the host, then the resulting neoplasm will consist of the proliferated elements of the *local* tissue cells *invaded*. Thus the free parasite emanating from a glandular-celled carcinoma may originate a squamous-celled carcinoma in another individual if it invades such tissue, or the free parasite from a squamous-celled carcinoma—of, e.g., the tongue—may give rise to a columnar-cell carcinoma of the stomach or rectum, or to a spheroidal-celled carcinoma of the mamma, or to any other variety of carcinoma, according to the structure of the tissue invaded. The great majority of malignant neoplasms which arise, apparently *de novo*, are of this primary type. They are originated directly by the parasite itself and indirectly by the tumour from which the parasite is set free. Thus the great variety of cancer is accounted for and to the free parasite are we indebted for the original neoplasm.

The secondary are formed of *alien* cells by the proliferation of the directly implanted infective tissue cells themselves, acting under the stimulus of intracellular malignant influence, the micro-parasite. When the parasite is encapsuled in a *living* cell and this cell gains access to any host the resulting neoplasm will be of the same variety as the *invading* cell, being formed by its proliferation in its new situation and not by the proliferation of the cells of the local tissue invaded, as in the primary type. All that the *invaded*

tissue cells do is to provide ordinary nutriment for the proliferating *invading* cells. Thus, the parasite-bearing *living* cell from, e.g., a columnar-celled carcinoma will originate another columnar-celled neoplasm by its own proliferation, quite irrespective of the structure or situation of the tissue invaded. Such infection is immediate and direct as regards the implanted cell and indirect as regards the inclosed parasite. All metastatic growths and all auto-inoculations are of this secondary type. For example, the metastasis from a neoplasm of the rectum established in the liver or lungs consists of proliferated rectal epithelial cells. All cases of "cancer-à-deux" and all cases of deliberately implanted cancerous growths are also of this type. So great are the activity and vitality of these malignant parasite-bearing cells that even one such left behind after an operation for the removal of a malignant neoplasm is able to reproduce it. Thus, the infection of invaded tissues by a parasite-bearing living cell, with subsequent proliferation of the latter, corresponds to what occurs after an unsuccessful operation. Now we see that Mr. Butlin's "carcinoma cell" parasite could only originate this secondary type of neoplasm while the origin of the enormous majority of malignant new growths is left unaccounted for by his hypothesis; but the primary type of origin accounts for this majority and supplies the original neoplasm from which the living cell, apparently acting as an independent parasite, emanates. It also accounts for the great variety of malignant neoplasms, a variety only limited by the anatomical diversity of tissues.

All this demonstrates how *true* a parasite the micro-organism responsible for cancer is. In the secondary type we find it comfortably ensconced in a living cell which it compels to slave for it, when implanted in any situation, stimulating it to proliferate and so provide accommodation for its numerous progeny. It exerts no personal influence whatever on the surrounding local tissue cells, which are generous enough to furnish the invaders with food supplies. It is only when death of the host occurs, or if perchance a cell dies and becomes detached from the colony, that its tyranny ceases for a time. Now it must make personal exertion and endeavour to find a fresh victim in the cell of the nearest available living tissue. Having succeeded in gaining a footing it proceeds to induce the selected invaded cell to commence work by proliferating, and the process progresses as before except that this time it is the cells of the local tissue which have both to increase in number and find their own food. This is the primary type.

In all other parasitic diseases the micro-organism of causation remains free and active personally, but the cancer parasite is the *truest* parasite of them all, for it never exists free if it can avoid it, but clings to its cell-host with indomitable pertinacity.

THE PARASITE OF CANCER.

Although its presence is proved by induction, as is also the existence of, for example, the micro-parasite of variola, the parasitic agent of cancer is, as the Germans say, "*noch nicht konstatirt*" (it has not yet been conclusively demonstrated). Doyen of Paris believes that the bacterium known as "micrococcus neoformans" is the germ responsible for cancer. This belief appears to be corroborated by the researches of Dr. C. Jacobs and Dr. Victor Geets, the result of which was communicated by them to the Royal Belgian Academy of Medicine at Brussels in January, 1906.[13] These observers report that it is practicable to immunise the human organism by means of a series of inoculations of the micrococcus neoformans vaccine, provided that these are properly controlled by examination of the opsonic power of the blood. They cultivated the micro-organism from 90 per cent. of tumours examined and succeeded in producing localised, or generalised, neoplasmic lesions in 30 per cent. of the cases, by inoculating young and vigorous cultures of the micro-organism into mice and white rats. They prepare the vaccine in exactly the same manner as Koch prepares his tuberculin T.R. and treat their patients in a similar way to the vaccine treatment of tuberculosis. They allege that in some cases they obtain cures, but point out, however, that as tuberculin does not cure all cases of tuberculosis, cancer vaccine, too, cannot cure all cases of cancer. Success or failure depends entirely upon the reserve of vital energy and capacity for reaction which each patient possesses, and these differ in each case. Other observers—e.g., Wright—have failed to confirm these results and they are, I believe, now discredited.

Roswal Park, Gaylord,[14] and others in America believe that cancer is caused by an organism of the same nature as the plasmodiophora brassicæ. Their observations seem to prove that minute plasmodiophoræ are present in carcinomatous tumours and that they can be grown from such tumours through a definite stage in their life cycle. In summarising their results and conclusions Dr. W. Ford Robertson and Mr. Henry Wade[14] state that they had been able to recognise in carcinomatous tumours bodies which, in their form and in their reaction to the platinum and silver-gold methods, are identical with the plasmodiophora brassicæ but from $\frac{1}{10}$th to $\frac{1}{20}$th of the size. They had succeeded in growing from three carcinomata an organism which accurately represented the post-spore or pre-amœboid stage of a plasmodiophora. If plasmodiophoræ were present in carcinomatous tumours it was hardly open to doubt that they had the same relation to the morbid growth as the plasmodiophora brassicæ had to "club-root," that was to say, that they were the determining etiological factor.

In a later communication (August, 1907) Dr. Ford Robertson[15] claims that he has obtained much new evidence which he considers confirmatory of this view, evidence derived from cultural and histological observations of the occurrence of special intranuclear bodies of the nature of those previously described, to show that structures morphologically identical with the spirochæta microgyrata can be demonstrated in human carcinomata. Gaylord and Calkins[15] have also described a special spirochæta in primary and transplanted carcinoma of the breast in mice. The confirmed discovery that spirochæta pallida is the etiological factor in syphilis is analogically suggestive of a spirochætan cause of cancer. Much undoubtedly remains to be done, however, before the elusive parasite can be demonstrated to the satisfaction of all; but these discoveries tend to show that the net is gradually, but surely, closing around it.

I offer the suggestion that the examination of fresh, living, carcinoma cells on the warm stage of the microscope would result in much additional and valuable information; also that the employment of high power microscopy would be a great aid to investigation. The objective of a microscope reaches the limit of its useful development in the direction of increasing magnifying power as soon as, by reason of the shortening of the focal length, the diameter of the object glass, in its principal plane, is reduced to something not much less than the diameter of the pupil. Added power, however, to any required extent can be obtained by high power oculars, but the image thus obtained is rendered defective by the blurring of the image from dust and obstructions in and on the lenses, and by the observer's eyelashes, tears, and muscæ volitantes; but, quite recently, the image has been rendered perfectly clear and very high magnifying power obtained by the skill and ingenuity of an expert in microscopy. In February, 1905, at a meeting of the Royal Institution of Great Britain, Mr. John W. Gordon[16] described a device by which a magnification of 7000 diameters could be obtained as well as a perfectly clear field of view. Mr. Gordon substitutes for the eyepiece a compound microscope with a half-inch objective and an ocular magnifying eight times. A ground-glass screen is held in the image plane of the principal microscope, and this screen is made to revolve and also at the same time to oscillate eccentrically. The screen abolishes the intrinsic images of dust and foreign matter and the eccentric rotary motion renders the screen invisible.

Quite as important as high magnification of the image is good field illumination. Dr. Siedentopf[16] has devised a system of dark field illumination, applicable to objectives of the widest possible aperture, which renders visible objects so minute and clustered so close to one another that by no other known contrivance can they be rendered separably visible at all. I must not further occupy time in describing this system of illumination and would refer those interested to the Proceedings of the Royal Institution of Great Britain, Vol. XVIII.

There is another desideratum of the greatest importance in the histological investigation of cancer which, I fear, is more likely to be sought for than found, and that is a specific staining reagent which will act on cancerous tissue in an analogous manner to the selective action of iodine upon the diseased areas in amyloid disease which renders them clearly distinct even to the naked eye. It is true that there is such a selective stain, but it acts only in one species of malignant neoplasm. I allude to the staining by melanin in melanotic cancer. Its presence makes it possible not only to detect every particle of original and metastatic growth in

this variety, both macroscopically and microscopically, but it also permits optical demonstration of the method of dissemination by the blood-vessels and lymphatics. This has been most ably demonstrated by Mr. W. Sampson Handley[17] in his Hunterian lecture on the Pathology of Melanotic Growths in Relation to their Operative Treatment.

THE CONDITION PRECEDENT.

Since perfectly healthy tissues are probably immune from, or invulnerable to, the attack of the cancer parasite, there must be causes predisposing to the acquisition of the disease, and these go to form what I have called the "condition precedent." This condition is induced by whatever lowers or impairs the power of resistance of the body to infection. In the case of cancer the chief factor in producing this vulnerability is degeneration of tissue from any cause, but more especially that due to obsolescence of organs, senescence, and senility, for cancer is, *par excellence*, the disease of advanced age, though by no means confined to it. This is obviously due to the fact that in those of middle and advanced age decay is in marked and increasing excess over repair (the reverse being the case in youth), and the tissues are less equal to the strain of resisting the attack of the aggressive parasite, especially when this degeneration exists in conjunction with the other predisposing factors of this condition, which are chronic disease, continued irritation, traumatism, and congenital susceptibility. In my opinion, it is the failure to realise the invulnerability of young and healthy subjects which is one of the causes of so many unsuccessful inoculation experiments. I have discussed this point fully in another paper.[2]

CHANNELS AND MODE OF INFECTION.

I have elsewhere[12] fully considered the channels of infection and it remains to consider how one becomes exposed, unknowingly, to the risk of attack by the parasite. This evil agent appears to be practically omnipresent, as so many other pathogenic micro-organisms are, such as the bacillus tuberculosis, the bacillus tetani, and the malevolent legion of micrococci, and it is ever ready to act aggressively as opportunity arises and circumstances favour. One hardly appreciates how very close the relationship is, if only indirectly, with our neighbours, including those suffering from cancer. All our food, both cooked and uncooked, passes through the hands of many individuals, and the only safeguard, cleanliness, on their part is practically beyond our control. As evidence of this I give you an instance from personal experience. A widespread epidemic of enteric fever which occurred in a village near Driffield, in which I had several patients, was easily traced to an imported case which was nursed by a woman who supplied milk to all those attacked. This woman, though altruistic, was a most uncleanly person and made it her practice to milk her cows without even washing her hands, and that immediately after attending to the discharges and soiled linen of her patient. Much vegetable food, e.g., salads and fruit, is eaten uncooked. Each strawberry, for example, we eat is gathered by the unwashed hands of the gatherer. Strawberries also lie very near the ground, as do lettuces, &c., and are readily accessible to domestic animals, such as the dog and cat, which also suffer from external cancer as well as from intestinal worms. There is an article published in THE LANCET of July 16th, 1904, entitled "Fruit and Filth,"[13] which will well repay anyone's perusal, provided the reader is not too greatly under the dominance of his nerves, or has not too lively an imagination, for anyone who reads that article is not likely to touch strawberries again unless he picks them himself from plants above suspicion of defilement.

Far be from me the desire to harrow your feelings too deeply, but how, let me ask, is one to know that the common house-fly, which crawls all over our bread and butter, or other article of food, was not, immediately before, disporting itself on the surface of a cancerous wound? Flies are well known to carry tubercle and typhoid bacilli, as well as other pathogenic micro-organisms, on their feet, and in the stomach, and it is also well known that they have infected food and drink with these germs, with disastrous results. I would refer you to a very able and suggestive communication published in THE LANCET of July 27th, 1907, under the title of "The Carriage of Infection by Flies."[19] This article gives the result of experiments made by Dr. R. M. Buchanan, bacteriologist to the corporation of Glasgow, with the object of demonstrating this fact. I wrote to Dr. Buchanan to inquire if he had made any experiments as to the cancerous contamination of food by flies and received the following reply: "I have not yet tried the experiment you suggest with reference to cancer, but hope to do so as soon as I can obtain material. The same problem presented itself to me in connexion with the death of a friend some years ago from intestinal cancer."

One's own footgear must bring much dust, laden with all kinds of pathogenic micro-organisms and, on occasion, dust from a cancer sufferer's room, into one's house, and it may easily find its way to one's food, &c. In this connexion the Eastern custom of leaving the outside shoes at the entrance of the house has, truly, much to commend it. Another risk to which we are exposed is eating the flesh of animals which have been suffering from malignant disease when killed. In December, 1904, according to press cuttings in my possession, a man was fined £50 and £7 costs at the Guildhall, London, for sending meat to Smithfield which on examination was found to be sarcomatous. It cannot be assumed that this is a solitary instance, only it happened to be discovered. Cooking is said to minimise risk, but underdone meat is not unpopular.

I once knew a dentist who suffered from cancer of the prostate, from which he eventually died, and who followed his occupation during his illness. One of the physical signs of his malady was a urethral discharge, which necessitated frequent manual attention. I have no reason to doubt that he occasionally washed his hands! In my own practice[1] a patient suffering from a fungating cancer of the mamma was nursed by a woman who frequently had occasion to remove soiled dressings and who was not particularly cleanly in her habits, and did not always wash her hands before meals. Within a year of her patient's death the nurse developed cancer of the stomach and died. This may have been a coincidence but I believe it to have been a case of indirect infection, a neoplasmic disease of the primary type.

I have thus indicated a few possibilities; some may be considered far-fetched, still they are possibilities, and unpleasant ones; doubtless many more will occur to yourselves.

PROPHYLAXIS.

From the foregoing it is obvious that the only reliable prophylactic against cancer as well as other filth diseases, and it is an efficient one, is cleanliness in its widest sense. Earth burial, with all its hideous possibilities, should be superseded by cremation of all who die from infectious disease, and especially from cancer. Cremation would deal with the disease at its source. All soiled dressings and discharges from cancerous subjects should be destroyed by fire and all rooms inhabited by them should be most thoroughly disinfected both during the illness and after death. No food should be prepared or consumed with unwashed hands.

NEW FACTS ABOUT CANCER.

Within recent years several new facts have been discovered about cancer. 1. The mitosis of the cells of malignant neoplasms has been found to be heterotype in character, whereas the mitosis of all somatic cells with one exception, and of the cells of benign tumours, is homotype. The mitosis of normal reproductive tissue is also heterotype. 2. It has been discovered that cancer is not restricted to the higher vertebrata, e.g., man and the domesticated animals, as was at one time supposed, but that it occurs in all vertebrata, with the possible exception of certain reptilia. The malignant growths occurring in other vertebrata are identical with those found in man, clinically, pathologically, anatomically, and microscopically. 3. The transmissibility of malignant new growths from one lower animal to another of the same species has been demonstrated.

With regard to the first of those discoveries it was the resemblance between the mitosis of malignant cells and that of normal reproductive tissue cells which led to the enunciation[4] by the director of the Imperial Cancer Research Fund of the famous analogical fallacy that malignant new growths are merely reproductive tissue in abnormal situations. The heterotype character of the mitosis of malignant cells and the homotype character of somatic and benign tumour cells are, indeed, of academic interest but of little or no practical importance beyond affording a possible means of differential diagnosis in some doubtful cases which, however, would signally fail in the case of tumours of the reproductive tissues, since the mitosis is heterotype in either case, whether benign or malignant. It has been suggested to me that the fact of the mitosis of malignant and generative tissue cells being heterotype in both cases was important as showing that generative tissue cells, like those of

cancer, have the power of proliferation. Of course, this fact cannot prove any such power, since analogy can prove nothing, but can merely suggest; still, if it could prove it it would not be necessary to corroborate the power of proliferation of generative cells, since the first infant one comes across is ample and convincing proof of that! At the same time there is a very suggestive parallel between the two proliferations. *Neither generative tissue nor other normal tissue cells can proliferate without a specific stimulus.* In the case of generative tissue the ovum only commences to proliferate when it has been invaded by the spermatozoon, which acts practically as an extrinsic specific protozoan parasite. The proliferation is enormous and rapid. The resulting tumour is benign, though some might consider it to be a malignant tumour in a normal situation! It is easily got rid of, and "recurrence" does not take place unless there is reinfection! In the case of somatic cells proliferation only commences when they are attacked by the cancer parasite. Mitosis becomes heterotype, proliferation goes on apace, and the tumour is malignant and impossible to eradicate. Nothing is known of the method of the influence of the cancer parasite on the somatic cell, any more than the influence of the spermatozoon on the ovum is understood, but it will be admitted that the one process is equally as marvellous as the other.

With regard to the second of these facts, among the vertebrata in which cancer has been discovered to exist are certain fishes, found both in rivers and in the ocean round our coasts. This fact has induced the director before mentioned to state[20] that "the wide zoological distribution of malignant new growths indicates that the cause of cancer is to be sought in a disturbance of those phenomena of reproduction and cell-life which are common to the forms in which it occurs." Thus he makes another statement of opinion which clearly indicates how little is the help towards solution that may be expected from intrinsic hypotheses and their advocates. To the "man with the open mind," however, it might probably occur, as it certainly does to me, that this wide distribution of cancer throughout the vertebrata, with the resulting great diversity in environment, food, and conditions of life generally, was suggestive of the omnipresence of a specific malevolent agent of great vitality; that, with regard to the fluvial and marine fishes found bearing cancerous growths, this fact might well suggest that the specific cause of cancer is water-borne and, like the bacillus typhosus, it is not injuriously affected by sea-water; and, finally, that since the neoplasms found in fish are identical in every way with those occurring in man, infection may well have arisen through the agency of parasite-bearing sewage polluting both the rivers and the ocean into which they flow.

Regarding the third discovery of the transmissibility of cancer from one individual to another of the same species, although this has had to be admitted, it is qualified by the assertion that such transmission is merely a transplantation of a graft of a malignant tumour and not the genuine inoculation of a specific disease. It would be more graceful to concede that since transmission between individuals of the same species is proved to be possible it may be eventually found that transmission between animals of different species, and even the development of one variety of malignant growth from another, is possible also.

An admission which may be looked for sooner or later is that a carcinoma of epithelial origin has been observed to give rise to a sarcoma in the adjacent connective tissue. Then will be confirmed the dictum that cancer is a specific infective disease and that one specific micro-organism is capable of originating every variety of malignant neoplasm, the variety depending upon, and only limited by, the anatomical diversity of the structure and the situation of the tissue invaded.

DEDUCTIVE EVIDENCE.

As it is necessary to apply the strictest canons of logic to the arguments brought forward in support of any hypothesis I beg to submit the following, which to my mind fulfils this postulate. Every specific disease is infectious to the individual. By this term, "infectious to the individual," I mean the gradual evolution of disease, more or less rapid, locally and constitutionally, over the body from the point of origin of the disease. Specific diseases infectious to the individual are very numerous and are caused by the agency of some extrinsic parasite, either a microphyte or a microzoon. These diseases are communicated to others, directly from individual to individual, or indirectly by inanimate objects, or through an intermediate host.

Now cancer is, emphatically, a specific disease, and it is intensely infectious to the individual; therefore, the only logical conclusion that can be drawn is that cancer is both transmissible to others and that it is caused by an extrinsic agent. Except for the solitary fact that the elements of a malignant neoplasm—i.e., its cells—are themselves transported, in addition to the infective agent (which is the peculiar and characteristic idiosyncrasy of cancer), this disease very closely resembles in its origin and evolution a chronic infectious disease.

My argument may be condensed into two syllogisms—viz: 1. All diseases which are infectious to the individual are transmissible to others. Cancer is infectious to the individual. Therefore cancer is transmissible to others. 2. All diseases which are infectious to the individual have an external origin. Cancer is infectious to the individual. Therefore cancer has an external origin.

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ON ANOMALOUS REACTIONS OBTAINED IN TESTING URINE FOR SUGAR WITH FEHLING'S SOLUTION.

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THE application of Fehling's test for the detection of sugar in urine is both simple and reliable in the presence of a fair amount of sugar. Urines in which a distinct reaction is obtained when boiled for a short time with an equal amount of Fehling's solution may, in almost all cases,[1] be held to contain excess of sugar, and such urines present no further difficulties. Practical experience, however, as well as an examination of the plentiful references to the reaction in clinical and other text-books, &c., show that the test as applied to urine in general is complicated by many difficulties and ambiguities. Different authorities seem to hold very divergent views with regard to the exact significance of certain results obtained with Fehling's test when the reaction is somewhat modified either with regard to the general appearance of the precipitate or the time taken to produce it. Thus on testing urine it is sometimes found that no result is evident after a good deal of heating with Fehling's solution, but that some time after standing an opalescent mixture is found to have taken the place of the blue solution, or perhaps there is a fairly definite yellowish-green precipitate. In other cases it is found that the mixture of urine and Fehling's solution gives on boiling for some time a dirty opalescent greenish milky liquid without any sign of a definite precipitate; at other times a more yellowish-green solution is in evidence; and all stages from a faint dirty greenish opalescence to a definite yellowish mixture exhibiting undoubted evidence of a precipitate may from time to time be seen in clinical work.

The significance of these ambiguous reactions has not been thoroughly dealt with in the literature of the subject and at present the general tendency is to explain them in a convenient, but not very helpful, way by reference to some disturbance by "interfering" substances. How these latter substances are supposed to interfere with the test is generally not very plainly indicated, but the general impression conveyed seems to be that they act in virtue of their direct reducing action and thus simulate sugar, though giving at

[1] Possible complications with glycuronic acid, &c., are not discussed here.

the same time a result somewhat different from that obtained from sugar, insomuch as the reaction is often modified, the result being a greenish and greenish yellow mixture, as mentioned above.

Causation of the Anomalous Reactions.

Some years ago the writer undertook an investigation into this subject in order if possible to elicit the causation of these ambiguous results and the clinical significance to be attached to them. The results of this investigation were published *in extenso* in the *Biochemical Journal*,[2] but as the subject is exceedingly important from the standpoint of practical medicine I propose to deal here with the part of greatest interest to the clinician.

If we take a normal urine giving no reaction with Fehling's solution and add to it a trace of sugar it will generally be found, on subsequent testing in the usual way, that no evidence of the presence of the added sugar can be detected; that this is not due to any lack of delicacy on the part of Fehling's solution is evident from the fact that this reagent will readily detect such a small quantity of sugar as 1 part in 125,000 parts water (0·0008 per cent.). Now since several times this amount of sugar often gives no result when added to normal urine and tested as usual we at once arrive at the conclusion that normal urine contains something which prevents small quantities of sugar giving a reaction with Fehling's solution. According to Dr. F. W. Pavy this inhibition of precipitation of cuprous oxide is due to the ammonia evolved by the action of the alkali of Fehling's solution on the nitrogenous constituents of the urine holding the suboxide in solution. In this way, of course, precipitation might be prevented provided the ammonia were present in sufficient abundance, but it will be shown later that the quantity of ammonia actually present is much too small to be of any account in this respect.

An examination of all the ordinary constituents of urine resulted in disclosing the fact that the substance which causes this inhibition of precipitation is kreatinin. Kreatinin has the power of holding in solution the reduced suboxide and so the mixture gives no evidence, so far as precipitation is concerned, of the presence of sugar. Now, since normal urine always contains a certain amount of sugar every urine would give a reaction with Fehling's test were it not for the kreatinin. The normal sugar of urine, of course, reduces its equivalent amount of Fehling's solution in the ordinary way but since the reduced suboxide is held in solution by kreatinin we get no evidence of the presence of sugar and thus with Fehling's solution average normal urine gives no apparent reaction. It will be seen that this action of kreatinin is more beneficial than otherwise, for it prevents mistakes being made with urine containing very little sugar —sugar of normal amount and only of physiological importance. The first effect therefore of kreatinin is to prevent a reaction with small amounts of sugar.

Nature of the Precipitate.

Kreatinin, however, possesses another very marked property—that of materially modifying the nature of the precipitate when there is a slight excess of sugar present. It will be shown later that this characteristic of kreatinin is a most marked one and exceedingly important in affording an intelligible explanation of the various different-coloured solutions and precipitates described above. In a paper published in the above-mentioned journal for April, 1907, I entered fully into the phenomenon and showed that the different-coloured precipitates obtained in urine testing were associated with, and dependent on, a difference in the degree of granularity of the particles of the precipitates. Thus, in a urine giving, after boiling for some time, a dirty greenish opalescent solution, the modified colour is due to the fact that the precipitate of cuprous oxide is present in an exceedingly finely divided state; in the case of a greenish-yellow precipitate the particles are still very fine but rather coarser than in the last; with a yellow precipitate they are still somewhat larger, and this increase in the size of the particles goes on until in a distinct red precipitate the size of the individual granules is much more marked.

It is customary to state that the red precipitate seen in testing distinctly diabetic urine is cuprous oxide, whereas the yellow precipitate in evidence when urines containing comparatively small amounts of sugar (say from 1 to 2 per cent.) are tested is cuprous hydrate. The difference in colour, however, is not dependent on the chemical nature of the precipitate present but on the state of subdivision of the particles, and it is likely that all urines really give a precipitate of cuprous oxide and that the statement to the effect that the yellow precipitate is cuprous hydrate is incorrect. The lower hydrate of copper, $Cu_2(OH)_2$, is such an unstable chemical body as immediately to suggest a doubt whether it is possible for it to appear in urine testing in the form of a permanent precipitate. With regard to this difference of colour of the precipitates being associated with the state of subdivision of the particles of the cuprous oxide, it is of interest to observe that some months after the publication of my paper dealing with the above a paper by Dr. Pavy appeared in THE LANCET[3] in which my general investigations were repeated. It is satisfactory to note that the above authority has quite confirmed my observations concerning the relations of colour and state of subdivision.

A consideration of the above facts enables us to understand the causation of modified results in urine testing. When the urine contains just a slight excess of sugar it reduces its equivalent amount of Fehling's solution in the ordinary way, but the kreatinin present modifies the nature of the precipitate so that it separates out in exceedingly fine particles; these fine particles floating in the liquid give a dirty, milky, greenish appearance to the liquid. It is thus obvious that these ambiguous precipitates are just modifications of the usual form, and are often (in fact generally) indicative of a slight excess of sugar above the amount present in normal urine. Of course, it is obvious that the presence of a sufficient amount of some other reducing body —e.g., glycuronic acid—would act in the same way, but observation shows that sugar is really the substance which most often gives these modified reactions. Again, it is sometimes necessary, in the case of those ambiguous precipitates, to boil for some time before a result is obtained; this is due to the fact that the kreatinin holds in solution the cuprous oxide formed during the initial stages of boiling, and it is only after the kreatinin can hold no more in solution that the modified precipitate separates out. Since a hot kreatinin solution is a more effective solvent than a cold one, there is a consequent tendency for the precipitate to settle out after standing for some time.

Reaction with Normal Urine.

Even normal urine, when boiled long enough with Fehling's solution, will give a distinct precipitate, and a consideration of what happens here will help us to make clear the processes involved in the case of urines with slight excess of sugar. With regard to this the following quotation from my paper may be of interest:—

> The chief reducing substances present in all normal urines are uric acid, carbohydrate material (of which the larger part seems to be dextrose), and kreatinin. Uric acid and sugar, however, differ greatly from kreatinin in regard to the time required to cause reduction. Both substances, in the percentage in which they occur in normal urine, are capable of effecting reduction almost immediately on the boiling point being reached; in the process of reduction they undergo destruction.
>
> Kreatinin, on the other hand, reduces very slowly indeed. When a normal urine is boiled with Fehling's solution, the uric acid and sugar present almost immediately reduce their equivalent amounts of the solution; no effect is perceived owing to the fact that the reduced suboxide is held in solution by the kreatinin; after boiling for a very short time the full reducing effect of both uric acid and sugar is completed. On continued boiling the kreatinin gradually causes further reduction, at the same time becoming gradually diminished in amount; part of it is probably converted into kreatin while part is destroyed.
>
> Ultimately a point is reached, at which the suboxide reduced by the sugar and uric acid, added to that reduced by the kreatinin itself, is no longer capable of being held in solution by the amount of kreatinin and its derivatives actually present in the urine at that moment; at this point precipitation occurs.
>
> Thus it will be seen that the reaction obtained from a normal urine is very similar in character to that obtained from a urine containing more than the normal amount of sugar, the chief difference being that the more sugar present the quicker the reaction occurs.
>
> In the presence of great excess of sugar the effect of kreatinin is of course quite obscured and of no practical importance. It will be seen that the influence of kreatinin on Fehling's solution is very marked and important, though somewhat different from that ascribed to it in the text-books where its action is generally considered in relation to its direct reducing power. This direct action occurs but slowly, and is therefore very insignificant when Fehling's test is used in the ordinary way; its direct inhibitory action, however, explains many points which are otherwise obscure, and for which no definite explanation has been forthcoming.

Dr. Pavy's Criticisms.

In THE LANCET of August 3rd, 1907, p. 290, Dr. Pavy in a paper advocating his own theory of the phenomenon takes exception to certain statements published by the writer in the *Biochemical Journal* for February, 1906, under the heading "Observations on Fehling's Test for Dextrose in Urine." After satisfying myself as the result of prolonged

[2] February, 1906, and April, 1907.

[3] THE LANCET, July 27th, 1907, p. 223.

experimental work that the quantity of ammonia evolved from the ordinary nitrogenous constituents—i.e., urea, uric acid, kreatinin, &c.—was quite incapable of giving rise to the reaction, I performed some experiments with a view to determine the possible effect of the ammonia always present in "loose" combination. By this, of course, was meant any ammonia that might be present in the form of salts as distinguished from ammonia generated from the nitrogenous constituents. All observers agree that a certain quantity of ammonia is always present in this form; in order to get rid of this ammonia I boiled the urine for a short time with the alkaline part of Fehling's solution. It this way the action of any ammonia present in loose chemical combination was disposed of. With regard to this point the statement made in my paper was as follows: "Were the reaction due to ammonia present in loose combination boiling the urine with the alkaline part of Fehling's solution for a comparatively short time should be sufficient to remove it." Dr. Pavy, however, seems to argue that my meaning was that the total ammonia of the urine—both the ammonia present as such and the ammonia generated from the nitrogenous constituents—would be evolved after boiling for a short time with the alkaline part of Fehling's solution. After quoting my statement as given above he proceeds as follows: "Dr. Maclean surmises that boiling the urine with the alkaline part of Fehling's solution for a comparatively short time should be sufficient to remove the ammonia. If he had ascertained by observation the effect produced he could not have expressed himself as he has done. As a matter of fact it is difficult to get away from the evolution of ammonia," &c. He then goes on to say that even if boiled to solidification ammonia is still freely evolved on the addition of water. That ammonia comes off after boiling urine and caustic alkali for a very long time I have often verified. This fact only adds further proof to the assertion that the amount given off in any given short period must be very small indeed. This ammonia, however, is generated from the nitrogenous constituents of the urine, and such ammonia could hardly by any play of imagination be referred to as ammonia in "loose combination." In quoting my statement (given above) Dr. Pavy italicises the words "should be sufficient"; if at the same time he had italicised the words "loose combination" all confusion would have been avoided.

It is, of course, commonly known that sugar is easily destroyed by the action of boiling caustic alkali and this fact is often taken advantage of in physiological chemistry when we wish to destroy the sugar in any substance previous to certain processes—quantitative estimations, &c.—which would be interfered with by the presence of sugar. For instance, in Neumann's well-known method for estimating phosphorus, when the substance to be operated on contains sugar—e.g., milk—it is first boiled with caustic alkali. This destructive action of caustic alkali towards sugar would, of course, destroy the sugar normally present in the urine when the latter is boiled with an alkali. Therefore after boiling urine with caustic alkali for some time in order to remove the loosely combined ammonia as described above it is necessary to add a little sugar to the boiled urine in order to test its inhibitory power when treated with Fehling's solution, since the sugar normally present has been destroyed. When this was done it was found that the urine still possessed marked inhibitory power, proving, of course, that the loosely combined ammonia was not itself the cause of the inhibitory action. With regard to this point, my paper reads: "Urines however to which small amounts of dextrose have been added previously do not give any more indication of the presence of sugar after boiling than before." "Previously" of course refers to the boiling of the urine with Fehling's solution. In other words, urines which have been boiled for some time with caustic alkali, and to which a small amount of sugar is added after the boiling is completed and previously to boiling with Fehling's solution (to represent the sugar of normal urine destroyed by the boiling alkali) do not give any more indication of the presence of sugar than if they had not been boiled at all. It may be that the above sentence as given in the *Biochemical Journal*, is ambiguous as far as the mere wording is concerned, and that it is possible to assign to it the interprepation adopted by Dr. Pavy. With reference to this point, Dr. Pavy says that I seemed "to have overlooked the destructive action exerted by a fixed alkali on dextrose. Instead of their being more indication of the presence of sugar after boiling with the alkaline part of Fehling's solution as is suggested should be the case through the expulsion of ammonia the actual effect that occurs is a disappearance of the sugar. It is easy for anyone to boil some dextrose-containing urine with the alkaline part of Fehling's solution, then add the copper portion and see the effect produced. Even with as much as 2 per cent. and over of dextrose present and boiling only for one minute sufficient destruction occurs to prevent any sign of reaction being obtainable, &c." It was, of course, to make up for the sugar destroyed that I added sugar to the boiled urine and while it is admitted that the sentence as it stands might possibly be interpreted as Dr. Pavy suggests such an interpretation would hardly have been expected from such an authority as Dr. Pavy.

In the same journal (April, 1907) another article was published in which I incidentally emphasised the destructive action of caustic alkali on sugar not as something not well known already but in regard to the *very rapid* action of the boiling alkali on small amounts of sugar. In the course of my research work I happened to ascertain that in many cases this fact was not generally appreciated and so thought it worth while to draw attention to the point, stating at the same time that "while it is a well-known fact that boiling with hot alkali destroys sugar it would seem that the extreme facility with which this is accomplished is hardly appreciated." With regard to the above Dr. Pavy says: "In this [article] Dr. Maclean shows that he has discovered the facility with which dextrose is destroyed by the agency of a fixed alkali and that he has learnt the caution that is required to be exercised in experimenting with sugar in the presence of an alkali to escape arriving at a fallacious conclusion." It is obvious from what has been said that the foregoing statement is inapplicable.

Inhibitory Influence of Ammonia.

In the same journal I gave the following table with regard to the inhibitory effect of ammonia on a weak dextrose solution:—

—	Ammonium hydrate, pure (0·88°), 1 in 10.	Ammonia calculated as nitrogen in milligrammes.	Results.
1 cubic centimetre of a 0·1 per cent. dextrose solution + 1 cubic centimetre of Fehling's solution boiled with—	1 drop.	1·5	Immediate precipitate.
	2 drops.	3·0	"
	4 "	6·0	"
	6 "	9·0	Precipitate after a few seconds boiling.
	8 "	12·0	"
	10 "	15·0	Precipitate after 6–10 seconds boiling.
	12 "	18·0	Precipitate after 8–12 seconds boiling.
	16 "	24·0	Precipitate after a little time.

In these experiments the urine was boiled with the alkaline part of Fehling's solution in a test-tube, just as ordinary urine is tested, in order to obtain a result as nearly as possible in harmony with the effects of the ammonia generated when urine is tested in the usual fashion. Dr. Pavy performed similar experiments but under materially modified conditions—the mixtures being heated in a boiling salt solution and not boiled directly over the flame—and makes the statement that "viewed in this way the table given by Dr. MacLean does not supply a correct representation. It is not correct to represent no effect as being producible by one to four drops of dilute solution of ammonia ..... after four drops the interval amounted to seven seconds ..... after six drops of the ammonia solution the interval was observed to stand at 12 seconds; after eight drops, 15; after 12 drops, 20; after 16 drops, 38," &c.

Now boiling the mixture rapidly over the flame is a very different matter from heating in a boiling salt solution and so no comparison can be drawn between the two sets of experiments, more especially since the intervals during which precipitation is prevented are, comparatively speaking, so insignificant when compared with the time taken for the production of a precipitate when normal urine is boiled with Fehling's solution. Such a large amount of ammonia solution as 16 drops is capable of preventing precipitation only for 38 *seconds*, and since urine (which would never contain this amount of ammonia per cubic centimetre) does not as a rule give a reaction until the boiling is continued for several *minutes*, I think that my table when viewed in comparison

with what obtains in urine gives a fairly true idea of the relative action of ammonia as an inhibitor of precipitation. It is certainly not customary when testing urine for sugar in the ordinary way to apply heat by means of a boiling salt solution, and as my experiments were purposely so conducted as to coincide as nearly as possible with the methods adopted generally in urine testing it may fairly be claimed that these results are representative of the effects produced in urine. A urine which with Fehling's solution would give a precipitate after, say, four minutes' vigorous boiling would require a longer period of heating before a similar precipitate would be given if the urine were immersed in a boiling salt solution; this can be very simply proved by simple comparative experiments, using portions of the same sample.

I think that the above explanations make it clear that in Dr. Pavy's article in THE LANCET of August 3rd my observations are unfortunately represented in a manner quite different from the true meaning assigned to them by me.

Dr. Pavy refuses to accept the view that kreatinin is the chief substance in urine which gives rise to this inhibitory effect, and argues that the evolution of ammonia generated by the action of caustic alkali of Fehling's solution on the nitrogenous constituents of the urine is sufficient to hold the reduced suboxide in solution when the latter is present in small amount. While it is common knowledge that ammonia has the power of holding cuprous oxide in solution, my assertion was that ammonia "is ordinarily evolved in too small an amount to markedly interfere with the reaction"—i.e., the precipitation of the cuprous oxide. In order to settle the point conclusively, however, I annex some experiments performed with ordinary urine in which a certain quantity of the urine was boiled with an equal volume of caustic alkali of the same strength as is present in ordinary Fehling's solution; such a mixture, of course, contains the same percentage of alkali as urine when mixed with an equal volume of Fehling's solution. The ammonia was collected in the ordinary way by means of $\frac{N}{10}$ sulphuric acid, and the latter titrated against $\frac{N}{10}$ sodium hydrate solution. The total amount of ammonia given off from the urine could in this way be easily and accurately determined, and affords a direct and simple means of judging of the part played by ammonia as an inhibitor of precipitation of cuprous oxide. Different amounts of urine were used, and boiling continued for different periods, but the following tables deal with mixtures boiled for five minutes, as this space of time represents roughly the time required to produce a precipitate in many normal urines when boiled with Fehling's solution.

TABLE I.—*25 Cubic Centimetres of Urine Boiled with 25 Cubic Centimetres of Caustic Alkali for Five Minutes.*

No.	Specific gravity.	Total amount of ammonia evolved in milligrammes.	Average amount per cubic centimetre of urine in milligrammes.
1	1020	25·5	1·02
2	1026	39·1	1·56
3	1018	24·6	0·98
4	1025	33·8	1·35
5	1026	40·1	1·6
6	1018	25·1	1·004

The average of the six experiments gives an ammonia evolution equivalent to 1·252 milligrammes NH_3 to each cubic centimetre of urine, this amount being evolved in five minutes' boiling.

TABLE II.—*10 Cubic Centimetres of Urine Boiled with 10 Cubic Centimetres Caustic Alkali for Five Minutes.*

No.	Specific gravity.	Total amount of ammonia evolved in milligrammes.	Average amount per cubic centimetre in milligrammes.
1	1020	12·3	1·23
2	1026	16·8	1·68
3	1015	14·1	1·41
4	1023	20 1	2 01
5	1020	26 2	2·62
6	1015	18 5	1 85

Average of above experiments = 1·80 milligrammes NH_3 per cubic centimetre evolved in five minutes.

TABLE III.—*15 Cubic Centimetres of Urine Boiled with 15 Cubic Centimetres of Alkali for Five Minutes.*

No.	Specific gravity.	Total amount of ammonia evolved in milligrammes.	Average amount per cubic centimetre in milligrammes.
1	1015	18·7	1·24
2	1012	21·2	1·41
3	1022	32·6	2·17
4	1024	22·1	1·47
5	1018	19·7	1·31
6	1015	20·5	1·36

Average of above experiments = 1·49 milligrammes NH_3 per cubic centimetre in five minutes; and the average of three sets of experiments from 18 different urines = 1·514 milligrammes NH_3 per cubic centimetre evolved in five minutes.

The above specimens were obtained from different sources and give a fair representation of the amount of ammonia evolved in a given time when urine is boiled with the alkaline part of Fehling's solution. Urines, therefore, may be considered as capable of evolving from 1·5 to 2 milligrammes of ammonia per cubic centimetre when boiled for five minutes with an equal volume of sodium hydrate containing the same percentage of caustic alkali as is commonly present in ordinary Fehling's solution; in other words, when urine is tested for sugar in the ordinary way with Fehling's solution 2 cubic centimetres of the mixture if boiled for five minutes would generate from 1·5 to 2 milligrammes of ammonia in that time. Now since the ammonia formed in the boiling liquid must be quickly driven off the amount of this substance present in the mixture at any given moment must be exceedingly minute. If we assume that the ammonia is formed at an average fixed rate per second, then the average amount generated per second in the boiling liquid will be from 0·005 to 0·007 milligramme NH_3 per cubic centimetre of urine. Now Dr. Pavy states that with one cubic centimetre of urine mixed with one cubic centimetre of Fehling's solution the addition of one drop of pure (diluted 1 in 10) ammonia (0·880) solution just appreciably hinders precipitation; observation proves that if there is any interval it is really exceedingly minute. If, therefore, such a comparatively large amount of ammonia as one drop which represents about 1·5 milligrammes of ammonia has but the very slightest effect it is obvious that the insignificant amount of ammonia evolved in urine testing with Fehling's solution has practically no effect in acting as an inhibitor of precipitation.

Again, if for purposes of comparison we assume that all the urea present in one cubic centimetre of urine is changed into ammonia say in five minutes' boiling, a simple calculation gives the total amount of ammonia formed. Average urine contains about 22 milligrammes of urea per cubic centimetre. The total ammonia evolution of 22 milligrammes of urea is 12·4 milligrammes NH_3.

$$\underset{\text{(mol. wt. 60)}}{CON_2H_4} = 2\underset{\text{(mol. wt. 34)}}{(NH_3)} = \frac{34}{60} \times \frac{22}{1} = 12{\cdot}4 \text{ mgs. } NH_3.$$

If we add another 2·6 milligrammes[4] for the ammonia generated from kreatinin and other nitrogenous bodies that may be acted upon, as well as for any ammonia present as such in "loose" combination, the total ammonia evolution per cubic centimetre of urine would amount to 15·0 milligrammes. Now the inhibitory effect of 15 milligrammes NH_3 is exceedingly small. This amount of ammonia corresponds to the amount present in ten drops of a 1 in 10 pure ammonium hydrate solution (0·880).

According to Dr. Pavy's results ten drops of ammonium hydrate of above strength added to a mixture consisting of one cubic centimetre of Fehling's solution and one cubic centimetre of a 0·1 per cent. solution of dextrose would prevent the ordinary reaction for about 17 seconds.[5] Since Dr. Pavy's experiment was performed under conditions entirely different from those generally adopted in urine testing (heat being applied by means of a boiling salt solution) the above period of 17 seconds may be taken as

[4] This is of course a very liberal allowance and does not represent the actual relationship between urea nitrogen and other nitrogen present; it is merely given for purposes of comparison.

[5] Dr. Pavy's actual figures are: 8 drops = 15 seconds delay; 12 drops = 20 seconds delay. From this it is obvious that 10 drops would be equal to about 17 seconds.

the maximum time. Here, then, according to Dr. Pavy, the total amount of nitrogen that can be evolved from one cubic centimetre of urine is capable of inhibiting the usual reaction when 0·1 per cent. of sugar is mixed with an equal volume of Fehling's solution only for about 17 or 18 seconds. Now as Dr. Pavy assumes that ordinary urine contains from 0·3 to 0·5 per cent. sugar it is obvious that a reaction with urine would not be inhibited for so long a period as with a 0·1 per cent. dextrose solution (seeing it contains more reducing substance). In fact, with a 0·5 per cent. solution we might reasonably expect little or no inhibitory action. Experiment shows, however, that one cubic centimetre of ordinary urine may be boiled with an equal amount of Fehling's solution for anything from three to five minutes before a reaction is obtained.

In the above experiments it is assumed for purposes of comparison that all the nitrogenous substances of the urine generate all their ammonia when boiled for five minutes with the caustic alkali. This, of course, is far from true, for it is proved by observation—as shown above—that but a comparatively small fraction of the total ammonia is evolved in this time. The following quotation from Dr. Pavy's paper is of interest in this respect: "The boiling [of the mixture boiled with the alkaline part of Fehling's solution] may be carried on in any open capsule until solidification has begun to take place and then on adding water and transferring to a test tube renewed boiling will be found to be attended with the free evolution of ammonia made manifest by moistened litmus paper introduced into the mouth of the tube." Seeing, therefore, that but a portion of the total ammonia is generated after boiling for five minutes it follows that the total amount present in the urine at any given time must be exceedingly insignificant both in quantity and inhibitory effect; in fact, it is certain that the ammonia can count for little or nothing in preventing precipitation of cuprous oxide in urine.

It might possibly be argued that the addition of ammonia as such to a mixture of sugar and Fehling's solution is not tantamount to the gradual production of ammonia in urine, and that after a few seconds' heating the ammonia is driven off. This objection is not a valid one, for the usual tests disclose the fact that ammonia when added to a solution of sugar boiled with Fehling's solution comes off in considerable abundance after the cuprous oxide has been precipitated; in fact, it is obviously much more abundant after the addition of a drop or two of the above dilute solution, than it is in the case of urine where, though ammonia is continuously evolved during the process of boiling, the indications of its presence given by prepared test papers held over the boiling liquid suggest that it is present in comparatively small amount at any given time. Again, as above mentioned, an amount of ammonia amounting to about 1·5 milligrammes when added to one cubic centimetre of 0·1 per cent. dextrose with one cubic centimetre of Fehling's solution and boiled, has but a very insignificant, if any, action as an inhibitor of precipitation, and here the precipitate occurs before the ammonia could possibly be boiled off; this is a case in which a fair amount of ammonia is present and yet there is little or no inhibitory action.

Influence of Kreatinin in Association with Urea.

Dr. Pavy again quotes from my paper the following observation:—

> Urea, in the percentage in which it occurs in urine, yields much more ammonia than the kreatinin of an equal amount of urine, and yet it possesses no apparent retarding effects; for a very dilute solution of dextrose (less than 0·01 per cent.) introduced into a 2·3 per cent. urea solution and mixed with equal parts of Fehling's solution gives quite a distinct reaction.

He then proceeds to say that when kreatinin is associated with the ammonia-generating product—urea—an effect is producible beyond that which is capable of being occasioned by kreatinin alone. Now, it is a fact beyond dispute that urea in the maximum percentage in which it ever occurs in urine produces no inhibitory reaction in a weak (say 0·01 per cent.) solution of sugar when the test is performed in the usual way. Dr. Pavy, however, finds that one cubic centimetre of a 0·1 per cent. sugar solution containing *four* times the urea present in normal urine gives a precipitate slightly in arrear of a similar mixture without urea and so argues that urea has of itself an inhibiting effect. This statement conveys a wrong impression with regard to the real facts, for Dr. Pavy admits that urea *in the percentage in which it occurs in urine* produces no inhibitory effect when boiled with sugar and Fehling's solution, and it was urine—or mixtures equivalent in strength of urea to urine—that I had under consideration when I published the above. The statement that four times the amount of urea present in urine has a slight effect in inhibiting the reaction is practically irrelevant, seeing that urine never varies in its urea content to such an extent as this. The urea of urine, therefore, though generating much more ammonia than kreatinin, has no effect in preventing precipitation.

Again, it is argued by Dr. Pavy that urea greatly enhances the inhibiting effect of kreatinin in virtue of the ammonia given off. The statement is made that with 0·05 milligramme of kreatinin + 1 cubic centimetre of Fehling's solution + 1 cubic centimetre of 0·1 per cent. sugar solution, the latter being mixed with two drops of 40 per cent. solution (i.e., *twice* the amount of urea for an equivalent amount of urine), inhibition was delayed for 35 seconds. Now, if this inhibition was caused by ammonia it is obvious that a very small amount of ammonia must be capable of increasing the inhibitory effect of kreatinin. Shortly after the above, however, Dr. Pavy makes the statement that with one or two drops of a 1 in 10 solution of strong ammonia there is no effect produced in inhibiting the reaction of the kreatinin when one cubic centimetre of a 0·1 per cent. solution of dextrose, one cubic centimetre of Fehling's solution, and one milligramme of kreatinin are heated. Now two drops of the above ammonia solution are equivalent to about three milligrammes of ammonia, and since experiment proves that urea does not give up more than about one-fifth or one-sixth or so of its nitrogen when boiled for five minutes it is obvious that the amount of ammonia generated in 35 seconds must be very small; the total possible evolution (assuming that all the N. of the urea is changed) is only 24·8 milligrammes of ammonia, and taking one-sixth of that amount we get 4·2 milligrammes of ammonia for five minutes' boiling. We are therefore justified in assuming that not more than three milligrammes of ammonia are generated in 35 seconds' boiling, and this amount of ammonia, according to Dr. Pavy's second statement, produces no effect in augmenting the inhibitory power of kreatinin. Even the untenable assumption that all the urea is changed in 35 seconds may be examined with profit; here 24·8 milligrammes of ammonia would be generated—an amount corresponding to about 16 drops of above ammonia solution, and we have it on Dr. Pavy's authority that 15 drops produce no effect. If, on the other hand, we assume that a good deal more than three milligrammes of ammonia is evolved, then, according to the same authority, this amount of ammonia should *decrease* instead of increase the inhibiting effect of kreatinin, for it is stated that over three milligrammes up to about 15 milligrammes of ammonia added (in solution of corresponding strength) to one cubic centimetre of a 0·1 per cent. sugar solution containing one milligramme kreatinin and heated with an equal amount of Fehling's solution actually decreases the kreatinin inhibitory power. It is only after 15 milligrammes are added that an increased effect is noticed, and of course it is impossible to imagine that anything beyond 15 milligrammes NH_3 could be evolved from the urea in 35 seconds.

Thus the statement by Dr. Pavy that urea increases the inhibitory effects of kreatinin in virtue of the ammonia generated is, according to his own observations, incapable of being accepted. Much more could be said with regard to the above, but it is the experience of the writer that urea in the percentage in which it occurs in urine neither inhibits the production of a precipitate in a weak sugar solution nor adds to any material extent to the inhibitory power of the kreatinin. Intervals of a few seconds are of no importance, and emphasising the importance of such short intervals tends only to produce an erroneous impression with regard to what actually happens in normal urine, where the time of boiling with Fehling's solution necessary for the production of a precipitate usually extends to minutes instead of seconds.

Effectiveness of Kreatinin.

Dr. Pavy bases his objections to my statement that kreatinin is the substance responsible for the reaction on the argument that the amount of kreatinin present in urine is too small to be answerable to any material extent as an inhibitor of precipitation. Now, according to very exact determinations of the amount of kreatinin in urine made by Folin,[6] it is estimated that the amount for average urine is from

[6] Zeitschrift für Physiologische Chemie, Band xli., S. 223.

1·5 to 2 milligrammes per cubic centimetre. The following table taken from his paper is of interest :—

Urines.	Amount of kreatinin in milligrammes per 10 cubic centimetres of urine.	Amount of kreatinin in milligrammes per cubic centimetre.	Urines.	Amount of kreatinin in milligrammes per 10 cubic centimetres of urine.	Amount of kreatinin in milligrammes per cubic centimetre.
1	6·15	0·61	6	17·4	1·74
2	12·5	1·25	7	21·3	2·13
3	19·1	1·91	8	16 6	1·66
4	11·6	1·16	9	13·1	1·31
5	20·25	2 025	10	19 8	1·98

Now one cubic centimetre of a 0·1 per cent. dextrose solution when mixed with one cubic centimetre of Fehling's solution is on boiling prevented from giving the usual precipitate of cuprous oxide for a considerable time by the addition of such a relatively small amount of kreatinin as one milligramme. Now, since normal urine generally contains, according to the above authority, from 1·5 to 2 milligrammes of kreatinin per cubic centimetre, it is obvious that urine, if it contains about 0·1 per cent. dextrose, would be prevented from giving a reaction for a considerable time by the amount of kreatinin normally present. Now average urine may be said to contain generally about 0·1 per cent. sugar, or at any rate to have an average reducing action due to carbohydrates equivalent to that exerted by a 0·1 per cent. solution of pure dextrose. This can be shown by various reagents which are not acted upon by the so-called "interfering" substances of urine. Such reagents are safranin and sodium-nitro-phenyl-propiolate. With safranin as an indicator the following examples of the results obtained by the writer may be cited :—

Urine.	Specific gravity.	Percentage of sugar calculated as dextrose.	Urine.	Specific gravity.	Percentage of sugar calculated as dextrose.
1	1020	0·11	6	1025	0·13
2	1014	0·08	7	1023	0·095
3	1023	0·10	8	1024	0·14
4	1021	0·125	9	1016	0·09
5	1022	0·08	10	1026	0·115

Here, then, it is seen that the average amount of sugar corresponds roughly to about 0·09 to 0·11 per cent. The examination of several hundred normal urines gave on an average a reducing power equivalent to 0·08 to 0·1 per cent. glucose—due to urinary carbohydrate.

The statements made by some observers that average urine contains anything up 0·3 per cent. or so of sugar are not borne out by observation, for if this were the case such an amount of sugar could be easily detected by Fischer's phenyl-hydrazin test. Normal urine does not, as a rule, give anything corresponding to a typical reaction with the test; this fact and various other tests show that sugar is seldom present in an average urine to this extent. That a urine may contain occasionally 0·2 or 0·3 per cent. of sugar and still be obtained from a healthy or "normal" subject is quite a different matter, but it is certain that average normal urine does not contain in general more than about 0·1 per cent. of sugar. Thus it is seen that the amount of kreatinin present is quite sufficient to act in a very effective manner as a retarder of cuprous-oxide precipitation when minute amounts of sugar are in question. Dr. Pavy, however, reasons as follows: "Kreatinin dealing with the quantity existing in healthy urine has but a limited power in delaying suboxide precipitation, and the power is only made manifest when the amount of suboxide being dealt with is exceedingly small. In the case of one cubic centimetre of a 1 per 1000 solution of sugar, one cubic centimetre of adjusted Fehling's solution, and one milligramme of kreatinin, compared with the counterpart without the kreatinin, marked delay is seen to occur. With a large quantity of suboxide, however, brought into the question, as, for instance, when a 5 per 1000 solution of sugar is used with the ordinary Fehling's solution, it may be said that practically no material indication of delay is perceptible. In urines giving the anomalous reaction it may be considered that somewhere about 3, 4, or possibly 5 per 1000 of sugar may be reckoned to be present, from which it follows that the kreatinin constituent cannot be regarded as answerable to any material extent for the delaying effect that may be noticed to occur."

Now the admission that one milligramme of kreatinin per cubic centimetre causes considerable delay is tantamount to saying that this amount would cause considerable delay in urine. As above stated, the amount in urine is generally considerably above this (from 1·5 to 2 milligrammes per cubic centimetre), and since the sugar generally corresponds to about 0·1 per cent. it is obvious that the kreatinin present is answerable to a very material extent for the delaying effect that occurs. The statement that urines giving the "anomalous reaction" (if this really means, as judged from the context, delayed precipitation or, in other words, average normal urines) contain about 0·3, 0·4, or possibly 0·5 per cent. of sugar is, in the opinion of the writer, as the result of exhaustive experimental work, absolutely unfounded. It has been my constant experience that urines giving a sugar equivalent of such a comparatively small amount of sugar as about 0·25 per cent. (or even less) invariably gave the usual modified reaction with Fehling's solution after boiling for a very short time, and never corresponded in their behaviour in this respect with average urine. Dr. Pavy then proceeds to argue that an increase in the alkali of Fehling's solution will prolong the interval prior to precipitation. With large amounts of alkali it is quite possible that some prolongation may be in evidence, but at most the difference does not amount to very much—at any rate, with moderate amounts of alkali—when considered in relation to the time taken by normal urine. Moreover, I have considered the reaction with ordinary Fehling's solution in regard to which I have already shown that the action of the alkali on the urea, &c., has little or no influence. Again, since Dr. Pavy admits that the amount of ammonia generated from kreatinin alone is not sufficient to inhibit the reaction it is obvious that, in solutions such as the above, in which there is no other product present to generate ammonia, the action must be brought about by some other means than by the evolution of ammonia. Therefore I think it is obvious that the above criticisms by Dr. Pavy can hardly be regarded as in any degree tending to invalidate my statement that "kreatinin is the substance in normal urine which most markedly interferes with Fehling's reaction in the presence of small amounts of sugar ..... kreatinin directly inhibits the effect of small amounts of sugar when boiled with Fehling's solution by holding the reduced suboxide in solution and not indirectly by generating ammonia; the latter is not present in sufficient quantity to materially affect the reaction."

Note.—For the full publications on the subject dealing with the points mentioned above see my paper in the *Biochemical Journal* for February, 1906, and April, 1907; also Dr. Pavy's papers in THE LANCET of July 27th (p. 223) and August 3rd (p. 290) and 10th (p. 361), 1907.

ON FERMENTS AND THEIR MODE OF ACTION.[1]

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THE subject of Ferments has been chosen for our consideration this evening because I wish to point out the mode of action of organised and unorganised ferments and their relationship to one another. It is also not without its bearing upon some forms of disease.

The analogy between fermentations of different kinds and the course of various eruptive fevers was indeed early recognised by ancient medical writers. Thus Robert Boyle, England's great philosopher, writing in the seventeenth century, says[2]: "He that thoroughly understands the nature of ferments and fermentations shall probably be much better able than he that ignores them to give a fair account of several diseases (as well fevers as others) which will perhaps never be thoroughly understood, without an insight into the

[1] A paper read before the Bournemouth Medical Society on Dec. 11th, 1907.

[2] Boyle's Works, Edition 1744, vol. i., p. 476.

doctrine of fermentation." He also realised that these ferments came from the outer air, for he says further: "Those parts of the atmosphere which, in a stricter sense, may be called the air, are in some parts so intermixed with particles of different kinds, that among so great a number of various sorts of them, 'tis very likely there should be some kind of an uncommon or unobservable nature." Again, a quaint writer, Mr. Place, speaking of the plague, says[3]: "When we consider what a vast deal of vapours a small thing sends out, and what a large space of air it will fill with it, and diffuse itself through, we may conceive a city, thoroughly infected, to be as it were clouded in pestilential fumes, as it would be with smoak, if on fire; and, if it come near such representation, 'tis vain to ask what way men, living amongst it, receive the infection; whether they draw it in with the breath, or it gets into the stomach by the venom sticking to what they eat or drink, or directly climbs into the brain by the sensory of the nose, since it is much 'tis all these ways."

In one of the early years of the registration of deaths the great master of statistics, Dr. William Farr,[4] crystallised all these imaginings into the one word "zymotic" as applied to various eruptive and other contagious complaints. As he said then: "The property of communicating their action, and affecting analogous transformations in other bodies, is as important, as it is characteristic of these diseases, which it is proposed therefore to call, in this sense, 'zymotic' (from ζυμόω: I ferment)." In another passage he says:[5] "The diseases of this nature are called Zymotic diseases; the peculiar processes, Zymoses: to distinguish them from fermentations, with which they have more points of contact than they have with combustion, or any common propagated chemical action."

It is scarcely necessary to point out how completely these anticipations of the old writers have been verified. A multitude of diseases have now been traced to the presence of micro-organisms similar in nature to the ferment of yeast and others to protozoa belonging to the animal kingdom. Toxins also and antitoxins of a specific character have been recognised, stored up, and used as prophylactics and vaccines.

There is no need to go into further detail on the important facts thus far ascertained, but it may be interesting to discuss the nature of the fermentative actions concerned and to attempt to point out the several modes in which they bring about the physiological and pathological changes of which they are the causes. About the middle of the last century a fierce controversy raged as to the nature of fermentation. On the one hand, the late Baron Liebig, who may be regarded as the father of modern organic chemistry, defended a sort of physico-chemical theory which he derived from his observation of the unorganised ferments of bitter almonds and of mustard seed. On the other hand, Berzelius and Dumas regarded fermentative changes as due to the vital reactions of living micro-organisms similar to the then recently discovered "yeast plant." Baron Liebig affirmed that fermentation was due to the communication of internal motion from the particles of a ferment to the particles of the fermenting substance, this movement causing an atomic change and consequent decomposition. The action was supposed to be usually started by oxygen and to be analogous to that of heat.

More than 40 years ago I ventured to point out that this theory is identical with that propounded by Sir Isaac Newton about 200 years before. With his marvellous intuition he thus speaks of fermentation in his treatise on "Opticks"[6] "The air abounds with acid vapours (oxygen) fit to promote fermentation, as appears by the rusting of iron and copper in it, the kindling of fire by blowing, and the beating of the heart by means of respiration. Now, the above-mentioned motions are so great and violent as to show that in fermentations the particles of bodies, which almost rest, are put into new motions by a very potent principle which acts upon them only when they approach one another, (our molecular force), and causes them to meet and clash with great violence, and grow hot with the motion, and dash one another into pieces, and vanish into air and vapour and flame." Put this into modern terminology and it exactly gives Liebig's theory. Is it not a wonderful instance of philosophical insight? A little later also, Mr. Place, whom I have already quoted, writing in 1721, says: "Infection is a communication of motion by activity"; and again, "All contagious operation is of the same quality as that of fire and differs from it only in degree."

As I have said, these views of Baron Liebig were not allowed to go unchallenged, and the controversy was not always carried on with appropriate scientific calmness. Hard things were said on both sides, and Liebig justly pointed out that Dumas and others, in invoking vital action, as an explanation of the phenomena of fermentation, were in no way doing anything to explain it, as they could not show how the micro-organisms acted. In an open letter to Dumas Liebig made fun of this view and gave a humorous account of a supposed experience of his own. He declared that as he was one day watching under the microscope the cells of the yeast plant he saw them suddenly take on an elongated appearance which presently caused them to assume the exact shape of miniature champagne bottles, at first well corked, but, by-and-by, the corks flew out and the stage was soon flooded with excellent sparkling wine.

Liebig's own theory was, however, open to several strong objections. 1. In the first place, oxygen is certainly not essential to the process. 2. The decomposition of the ferment does not necessarily take place, though there is probably some modification in its nature. 3. On the contrary, the preserving power of the gastric juice and the fact that many fermentations will go on in the presence of powerful antiseptics would lead us to the conclusion that the decomposition of the ferment is certainly not essential. 4. When ferments putrefy they lose their power. 5. The action of most ferments is specific; each ferment will only act upon its appropriate material. 6. The result, in many cases, is not decomposition or lysis, but synthesis. 7. Lastly, in many instances the presence of living organisms *is* necessary to the action.

Fermentations may, indeed, be grouped under two heads: first, those in which micro-organisms are always present; and secondly, those in which the specific agent is unorganised. The Germans call them "formte" and "ungeformte Fermente," respectively. In the first group are included: (1) all the organisms concerned in the production of fermented liquors; (2) the micro-organisms producing various eruptive, contagious, and non-contagious diseases, such as scarlet fever, measles, and the like, whooping-cough, diphtheria, ague, sleeping sickness; and, lastly, the various epizootics. In the second group are: (1) all the physiological ferments; (2) those bringing together the components of essential oils and of dyes; (3) those which assist in the ripening of fruits; and (4) the unorganised derivatives of living ferments. At first sight these two groups of ferments would seem to be quite distinct not only in their form but also in their mode of action. Yet it may be that this is not the case.

In truth, little is known as yet as to the exact nature of fermentative action. It is certainly not due simply to chemical affinity, though it affects the chemical affinities of other substances. A true ferment, such as diastase, will change successive portions of the substance, starch, upon which it has a specific action; and its power is only slightly lessened after each fresh admixture. Moreover, it never enters into chemical combination with the object of its attacks. Its closest analogues are rather such inorganic bodies as spongy platinum and animal charcoal, which owe their power to surface condensation, and are hence called "catalytes" or "catalysts." These bodies, by their very inability to enter into chemical combination, permit their surfaces when cleansed by heat, or in other ways, to come into such close contact with gases or liquids as to enable what are called molecular forces to come into play.

It appears, then, that we have to attempt to explain fermentative action, of which we know little, by means of molecular force, of which we probably know less. It will be well, however, to recall what is known about it. We may with safety affirm the following propositions with regard to molecular influence: 1. That molecular influence depends essentially upon the elementary molecular constitution of bodies. 2. That it acts without regard to mass. 3. That it increases inversely as the distance, at some enormous ratio, being excessively powerful within molecular distances, and utterly insensible beyond them. 4. That its action is in some way affected by calorific, electric, and probably by luminous vibrations and by chemical affinity. 5. That it does not seem to differ in kind from the attraction of cohesion, which binds together the molecules of the same substance

[3] Hypothetical Notion of the Plague, p. 12.
[4] Vital Statistics, 1885, p. 246.
[5] P. 327.
[6] Second edition, 1715, vol. ii., p. 355.

6. That chemical affinity may be similar in kind, but that it differs from molecular attraction in the power of producing chemical combination of the molecules between which it acts.

When molecular operations take place between the particles of bodies of dissimilar composition the following conditions are found to favour the production of molecular changes: 1. That two or more of the substances submitted to molecular influences should have a more or less powerful attraction for one another. 2. That their physical condition be favourable to molecular action. 3. That the molecular agent or "catalyte" should have very low *chemical* affinities for the substances acted upon. 4. That the molecules of the catalyte be free—i.e., that their surfaces be clear of any contamination by other liquids or gases. 5. That the catalyte be freely permeable by other substances. All these conditions are fulfilled by typical catalytes such as "platinum black and animal charcoal."

In his work on Electrons Sir Oliver Lodge[7] attempts to account for some of the phenomena of molecular action. Thus (p. 155) he says: "There is another kind of adhesion or cohesion of molecules, not chemical, but what is called molecular. This occurs between atoms not possessing ionic or extra charges, but each quite neutral, consisting of paired-off groups of electrons. At any moderate distance the force of attraction between paired electrons will be next to nothing, but at very minute distances it may be very great, ultimately becoming almost indistinguishable from chemical combination, except that the cling will be a weak cling at a multitude of points, instead of an intense cling at only one." He gives diagrams illustrating his theory and then continues: "Molecular forces on this view are electrical, just as much electrical as are chemical forces; but they occur between chemically saturated molecules and are due to the interaction or distant influence of paired electrons on each other across molecular distances. It may be said to be a result of residual affinity."

There are probably other conditions governing the molecular action of "catalytes," whether inorganic, organic, or organised, but on further examination they may perhaps suffice to show the intimate relationship that exists between all kinds of ferments. Let us take first the action of our second group, the "unformed" ferments, such as diastase, pepsin, trypsin, erythrozyme, synaptase, and the like; and the various products of organised forms, such as are secreted by yeast, and by divers other micro-organisms. 1. These bodies all possess the characters which, as we have seen, belong to "catalytes." They are all nitrogenous substances and thus contain one of the most chemically inert bodies in nature. These compounds are also among the most unstable bodies in nature—e.g., nitro-glycerine, &c. 2. They are all "colloidal" in structure and are thus themselves chemically inert. 3. Owing to this structure they are bodies in a state of continual molecular *change*, and their particles are constantly being presented to substances in their immediate neighbourhood in a fresh, clean, and nascent condition. They are thus able to exert to the uttermost any molecular power which they may possess. 4. They are all specific in their action; in other words, they only affect substances with which they have special molecular affinities. 5. They readily permit the diffusion among their particles of other bodies, especially those of a crystalloidal character.

Let us consider for a moment this physical power of colloids. Though chemically inert, in the ordinary sense, colloids possess a compensating activity of their own, arising out of their physical properties. Thus, notwithstanding their apparently feeble affinity for water, anhydrous colloids can decompose certain crystalloid hydratics, such as hydrated alcohol. Further instances of their physical power are to be seen in their adhesiveness and in the phenomena of cementation. The adhesion of colloid to colloid appears to be more powerful than that of colloid to crystalloid; thus, two pieces of plate glass left in contact will after a time adhere so closely that no division can be detected between them and they may be cut and ground without separating; and, again, the intense syneresis of isinglass, dried in a glass vessel over sulphuric acid, in vacuo, enables the contracting gelatin to tear up the surface of the glass. Colloids also, like platinum black and animal charcoal, are extremely permeable, and the diffusion of a crystalloid appears to take place through a firm jelly with little or no abatement of velocity.

All ferments then are easily penetrated by the material upon which they act. Their molecules are loosely aggregated together, thus presenting a large surface and a series of points of force from each of which any peculiar molecular influence (whatever it may be) can act without perturbation from other surrounding molecules. They are all, again, like their inorganic congeners, chemically indifferent. This character, in fact, is essential to substances acting by contact. Although so little is known of molecular forces it is certain, as I have before said, that they require extreme approximation of the particles influencing each other and that their power increases, in some enormous ratio, inversely as the distance. It may easily be conceived, therefore, that this chemical indifference of ferments will enable their ultimate particles to come into close contact with other substances without uniting chemically with them and in consequence destroying the molecular power of the ferments. Chemical inertness is characteristic of the whole range of bodies exercising fermentative power. Furthermore, as platinum black and its congeners act with the greatest energy when their surfaces have been freed from all taint of vapour or impurity other than that upon which they are about to act, so organic ferments are most active when they are in a nascent condition, their particles freshly formed, or at least freshly arranged and free to attach themselves to the material which is appropriate to them. To come down to concrete examples, I venture to think, for instance, that the changes produced during digestion by the unorganised ferments are brought about chiefly by purely molecular influences analogous to the so-called catalyses wrought by many inorganic substances. On this hypothesis it is not difficult to understand why a very small proportion of a ferment suffices to act upon large masses of suitable material; for the molecular action once completed upon one part of the mass is not necessarily exhausted or neutralised thereby. If the substances formed by the action of the catalyte have less molecular affinity for it than the original material had they will at once be released; the original energy of the ferment persisting, because the ferment experiences no transforming molecular reaction, it will attract fresh portions of the more appropriate material, and the action will go on almost indefinitely.

It has been suggested by more than one observer that the action of a ferment is similar in kind to that of NO when it acts as a carrier of oxygen to SO_2 in the manufacture of sulphuric acid. Others again have in similar fashion pointed to the operation of molybdic acid in quickening the interaction between peroxide of hydrogen and hydriodic acid. In the latter case Brode has shown that 1 gramme of molybdic acid in 31,000,000 litres of water exercises this power. This has been compared to the action of a ferment. The analogy is, however, not quite sound. Both these operations are distinctly chemical in their nature and are due to chemical affinities acting in accordance with definite atomic weights. Ferments, on the contrary, are chemically inert and owe their molecular power to this very fact. In other words, in the one case the intermediary effects the operation by chemical affinity alone, in the other the ferment acts by molecular influence. Notwithstanding this, however, it is highly probable that in fermentation there is some kind of temporary union between the ferment and the body it acts upon, the "substrate" as it is called; but, seeing that the ferment is a colloid and chemically inert, it is most likely that the nature of the temporary union is physical and not chemical. In this account of the process it will be evident also that there is no need for a chemical change in the product, for the change may be a physical one only. The effects wrought, for instance, by pepsin upon fibrin, albumin, and other proteins may be a molecular one and they are not without a parallel in the history of other colloidal substances. Thus, certain gelatinous colloids are liquefied, without chemical change, in short spaces of time by very minute quantities of reagents. Gelatinous silicic acid is liquefied by very small portions of caustic potash. One part of this agent in 10,000 of water dissolves 200 parts of silicic acid, estimated as dry, in 60 minutes at 100° C. The alkali, too, after liquefying the colloid may be separated again from it by diffusion into water upon a dialyser. This solution, says Dr. Graham, who first pointed out the differences between colloids and crystalloids, "is analogous to the solution of insoluble organic colloids in animal digestion. Liquid silicic acid may be represented as the peptone of gelatinous silicic acid. Certain other colloids, such as the pure jellies of alumina, peroxide of iron, and titanic acid, are even more closely assimilated to albumin in this respect, since they are peptised by minute quantities of hydrochloric acid."

[7] See Lodge in Nature, 1904, vol. lxx., p. 176.

Again, the rapid absorption of albuminous fluids after digestion points to some change of molecular constitution effected by the catalytic action of the ferments, making the peptones, if not crystalloid in their character, at any rate diffusive and able to traverse membranous septa. There would be nothing contrary to experience even in the first supposition. Dr. Graham has shown that colloids are capable of taking on the crystalloid form. Thus in the "blood crystals of Funke" a soft and gelatinous body is seen to assume the crystalloid form. The solid condition of water also, as in ice and snow, is both colloid and crystalloid; and Quartz declares the same power to be possessed by silica.[8] But it is probable that a mere change of molecular constitution short of crystallisation may confer the power of diffusion upon colloids, seeing that albuminose, produced by the action of pepsin on proteids, is endosmotic in character—that is, that the digested albumin is so far altered as to make it less adhesive to animal membranes and more easily miscible with blood and lymph than undigested albumin, and thus capable of osmosis.

Turning now to the first group of ferments, those that are formed and living, it is quite possible that even in fermentations brought about by these organisms the eminently catalytic powers of nascent nitrogenous colloids may come into play. In his early researches on these fermentations M. Pasteur himself concluded that the mycodermic plant which effects the change of alcohol into vinegar or into carbonic acid and water "does not act by means of some agent which it secretes and then leaves to work by itself, but," as he goes on to remark, "the chemical phenomena which accompany the life of the plant depend upon some peculiar physical condition analogous to platinum black." "It is, however," he says, "essential to remark that this physical condition of the plant is in some way closely bound up with its life." Whatever be the mode of their operation, it is certain that the organised ferments and probably most of the bacteria are able to produce what are called "enzymes," amorphous colloidal substances, which have perfectly specific powers of attracting and changing the constitution of certain other bodies. Enzymes are, in fact, the organic, but merely molecular, catalytes met with in the living cell, and one of the earliest of these to be made known was "invertase," extracted by Berthelot from yeast. The "clastic" power of all these enzymes, probably owing to their colloidal nature, is destroyed by temperatures of from 50° to 70° C. (which cause coagulation, or, at any rate, a disappearance of the interspaces between their molecules), but for the most part their activities are not prevented by the presence of antiseptics. Thus, salicylic acid and thymol in moderate quantities do not hinder peptic or tryptic digestions, although they prevent the putrefactive changes due to organised ferments.

The enzymes produced by living organisms have been grouped under the following heads: (1) proteolytic; (2) diastatic; (3) inverting; (4) coagulation; and (5) sugar-splitting. Among the first group are some, allied to trypsin, which act only in alkaline fluids, and others, allied to pepsin, which are active under acid reactions. Many bacteria belong to the diastatic class and secrete starch-changing enzymes. A smaller number of them produce inverting enzymes, converting saccharose into dextrose, others coagulating enzymes. Group (5), the sugar-splitting ferments, are, however, often secreted by bacteria and they all seem to be of a similar nature to the zymase of yeast cells. In addition to these comparatively innocent products bacteria give rise, as we well know, to numerous toxins, as well as to ptomaines. Many of the former bodies are probably fermentative in character, but the latter are crystallisable substances, analogous to vegetable alkaloids and compound ammonias. This will suffice for the first group.

Returning now to the subject of ferments in general we remark that one of their most important attributes is their "specificity"; that is, their selection of the substances upon which they exert their molecular power; that, however, this selection is not altogether exclusive may be seen from the following examples. Thus starch is transformed into dextrine and glucose by diastases, by ptyalin, and by many other animal substances, but not by pepsin, but the isomeric substance inulin is unaltered by diastase. Cellulose, again, is fermented by a peculiar ferment which does not act upon starch. Gum and vegetable mucilage are not altered by saliva or by gastric juice, and assamar, the bitter substance formed by toasting bread, sugar, &c., is not fermentable at all. Cane sugar is not altered by diastase or by emulsin, but the sugar cane contains a colloid body which converts sugar into a substance intermediate between starch and glutin. Sorbite, another form of sugar, secreted by the mountain ash, is not fermentable by yeast, but when left in contact with cheese and chalk it suffers decomposition, giving rise to lactic acid, alcohol, and butyric acid, without previous formation of fermentable sugar. Mannite and dulcite are also not fermented by contact with yeast, but they are decomposed by lactous ferment in presence of chalk, with evolution of CO_2 and H_2O and formation of alcohol, lactic acid, and butyric acid. Black mustard flour or myronic acid produces the essential oil of mustard and glucose under the influence of myrosine, but it is unaffected by yeast. Amygdaline is changed by emulsin obtained from a limited number of sources into bitter almond oil, prussic acid, and sugar; but the albumins of other plants, rennet, pancreatic juice, and saliva produce in it no change. Tannic acid is converted by the pectase of gall-nuts or of turnips into gallic acid; but emulsin, yeast, vegetable or animal albumins and legumin retard rather than promote this fermentation. None of the ordinary ferments, with the exception of emulsin, are capable of effecting the decomposition of rubian, in madder, but erythrozyme produces an effect altogether *sui generis*.

The enzymes, derived from living organisms, such as blood corpuscles and bacteria, are equally as specific as, if not more specific than, the foregoing ferments. Hæmolysins have been found so accurate in their selective power as to have been used for the detection of human or other blood-stains in medico-legal inquiries. Agglutinins and precipitins are now widely employed in the diagnosis of microbic diseases. Toxins show distinct specific molecular affinities for definite structures of the body, as in the case of tetanus toxins for the nervous system, and they are daily neutralised by appropriate antitoxins.

From a medical point of view, the last-mentioned subject, namely, the action of antitoxins, is the most important of all, but it would need another paper in which to discuss it. I may say here, however, that I regard the neutralising action of an antitoxin upon a toxin as a particular instance of the action of a ferment upon its substrate, and I may quote here Dr. Abbott's remark that "for all the foreign irritants from which animals have been immunised, be it alien blood, tissue cells, milk, or bacteria, there are, circulating normally in the blood, 'complements' specifically related to each irritant on the one hand and to its 'receptor' on the other."[9]

It is true that Ehrlich believes that the saturation of toxin by antitoxin is accomplished by chemical union, but Starling[10] shows that the amounts of "agglutinating serum" taken up by a suspension of bacilli is not a definite quantity but is determined by the concentration of the serum. He also points out (p. 38) that "even in a neutralised mixture, both free lysin and free antilysin, or free toxin and free antitoxin are present, and it needs only the alteration of the physical conditions of the mixture in order to display the action of one or other of these bodies." He asks, "How, then, are we to regard this combination of toxin with antitoxin?" and he decides that "though it is impossible to give a decisive answer to this question at the present time it seems probable that the specific combination of ferments with definite substrates is in all respects analogous to the combination of toxin or lysin with their corresponding antibody." He further points out that "the assumption of the colloidal condition—a condition in which there is an enormous exaggeration of surface—seems to be an important condition in deciding the catalytic effect of any given substance." He instances platinum and other metals in the condition of what are called "sols"—i.e., colloidal solution—and he concludes that "in every case we must regard adsorption by a surface

[8] In the last edition of his work on "Human Physiology" Professor Starling gives several instances of the crystallisation of proteins. Thus he says (p. 31): "It has long been known that proteins occur in the crystalline form in the seeds of certain plants, as in hemp-seeds, para-nut, and pumpkin, and castor-oil seeds. These crystals, which are known as aleuron grains, consist of proteins belonging to the class of globulins. By mechanical means they can be separated from the surrounding tissues, and after washing be dissolved in a solution of magnesia. It is also easy to crystallise egg-albumin and serum-albumin. White of egg is treated with an equal bulk of saturated solution of ammonium sulphate to precipitate the globulins and filtered. The filtrate is rendered slightly acid with dilute acetic acid, which is added until a slight precipitate is formed. The mixture is put aside for 24 hours, at the end of which time the greater portion of the albumin has been precipitated as fine needle-shaped crystals. A similar method is used in the case of serum albumin."

[9] Abbott, p. 608.

[10] Physiology of Digestion, p. 37.

as the essential factor," though he admits that the exact adsorption "which takes place is evidently a function of the chemical configuration of the substance forming the surface." He goes on: "We cannot otherwise account for the specific interaction between toxins and antitoxins, or for the specific action of the different ferments on their various substrates. We have here, therefore, a special class of interactions, not entirely chemical and not entirely physical, but depending for their existence on a coöperation of both chemical and physical factors. To definitely assign ferment actions to this class would be premature. There is, indeed, evidence that ferments act on the substrate by forming intermediate combinations with it, but whether these compounds are to be regarded as chemical or adsorptive we have not yet sufficient evidence to determine. The facts that all the ferments belong to the class of imperfect colloids and that in many cases—e.g., proteolytic ferments and diastase—their action is on complete colloids, would certainly suggest that the combinations must be of the physical type." You will observe that this is exactly my own argument and it is no small satisfaction to me to find that so eminent a physiologist has arrived independently at conclusions which I ventured to formulate and to publish more than 40 years ago in a paper on the Physiological Relations of Colloid Substances.[11]

Bournemouth.

A CASE OF PARAPLEGIA DUE TO AN INTRA-MEDULLARY LESION AND TREATED WITH SOME SUCCESS BY THE REMOVAL OF A LOCAL ACCUMULATION OF FLUID.

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History of the patient's illness and remarks thereon by Dr. WARRINGTON.—In view of the safety with which the spinal cord can now be exposed, a correct diagnosis of the cause of paraplegia is of much importance to the patient, for though the number of cases in which surgery can intervene is small the results obtained when operation is justifiable are strikingly successful. The conditions causing a slowly increasing paralysis of the lower limbs are not numerous, and when the more common diseases such as disseminated sclerosis, amyotrophic lateral sclerosis, syringomyelia, and the results of tubercle and syphilis are excluded, and this should not be difficult, the diagnosis must be carefully considered, for the cause may be one of those conditions in which surgery affords the best or only chance of remedy. Tumours of the meninges are naturally the cases in which the most brilliant results have been obtained. The essential symptom is the combination of pain limited to definite regions of root distribution with paralysis indicating an advancing transverse lesion of the cord. Even should pain be absent, a progressive palsy indicating interference with conduction at some level of the cord should suggest the presence of a tumour-like growth. For in the first place there are a number of cases on record in which a tumour has been successfully diagnosed and in which pain was not a prominent symptom, and in the second place pathology teaches that a simple chronic transverse myelitis is a lesion rarely found. Lesions and growths within the medulla spinalis itself are considered inoperable. This case is recorded as an instance in which a focal intra-medullary lesion was diagnosed and found and in which the removal of about 2 cubic centimetres of fluid was followed by great relative improvement in the patient's condition. The pathology of the case is not demonstrable, but the history and symptoms lead me to believe that the original lesion was a glioma of the cord and its etiology connected with an injury.

A man, aged 22 years, a patient of Dr. E. Cleaton Roberts, was first seen by me at the David Lewis Northern Hospital, Liverpool, on Feb. 14th, 1907. He was completely paraplegic and gave the following history. In January, 1903, when engaged in work in a coal-pit, he slipped on a plate at the crossing of truck lines and fell backwards on to one of the metals, falling on to the lower part of his spine. He was able to continue his work but stated that he at once experienced pains about his legs. The pain persisted for three months, usually of an aching character, but sometimes shooting down the legs and round the waist. For a short time after the accident he had a little difficulty in walking, though apparently this did not amount to more than a "stiffness about both hips." At the end of three months the pains ceased, but came on occasionally for the next two years; he does not appear to have suffered in any other way. Loss of power in the lower limbs was first noticed in February, 1905; it was not, however, very marked and under the advice of a distinguished surgeon he remained completely in bed for three months. At the end of this time the patient thinks the weakness had increased; he could, however, just walk about with the aid of a stick. Increase in power gradually followed and he was able to walk fairly well. At Easter, 1906, progress was interrupted by an attack of pneumonia, which ran a favourable course, but it is from the period of convalescence after his illness that the patient dates the onset of his permanent palsy. He was, however, again able to walk about without assistance until three months ago when on waking in the morning he found that the right lower limb was completely powerless. Gradually the power of the left diminished and when first seen he was practically absolutely paraplegic. Lately the patient had noticed slight hesitancy in micturition.

To summarise this history the salient features appear to be: Injury to the lower part of the spine followed by pain in the lower limbs and trunk for two years; a slow and slight weakness in the legs becoming worse after a period of rest in bed and, after an attack of pneumonia, a gradual recovery, then a sudden complete paralysis of the right leg and a gradual paralysis of the left, leading to complete paraplegia. Nothing of interest was elicited from the family or antecedent medical history. Syphilis could apparently be excluded and there was no evidence of tuberculosis in any of the viscera.

The condition on examination was as follows. The general health of the patient was excellent and no disease other than that of the nervous system was detected. The urine was normal. Both lower limbs were absolutely powerless with the exception of a very feeble flexion of the thighs. The limbs were flaccid; the feet and legs were blue and cold. On the inner side of each great toe there was a small sore. The muscles were flabby and the right limb in comparison with its fellow was wasted. Electrical irritability was normal both to faradic and galvanic excitation, though somewhat diminished in the right side. Both knee-jerks were extremely feeble, so that it was doubtful at times if the left could be obtained. The ankle-jerks were absent; the right plantar response was of a feeble extensor type, the left was not obtained. Occasionally involuntary spasmodic flexion movements of the legs and thighs occurred. Abdominal, epigastric, and cremasteric reflexes were not obtained. The diaphragm and intercostal muscles acted well. The cranial nerves and the upper limbs were normal. The spine was carefully examined without detecting any deformity, but pressure over the ninth to twelfth dorsal spines caused pain round the trunk at the level of the last rib on both sides. Flexion of the spine also caused some pain about the mid and lower dorsal region. Retention of urine was present on two occasions, once persisting for 86 hours.

With regard to sensation, a fairly horizontal line starting posteriorly from the ninth dorsal spine or passing anteriorly through the lowest part of the ensiform cartilage and thus corresponding to the seventh dorsal spinal segment formed the upper limit of a fairly well-defined loss of sensibility. Below this, pain from a pin prick and the recognition of heat or cold were absent, but on the right side over the leg and thigh a touch by cotton wool was felt as well as the pressure produced by the head of a pin. On the left side both these forms of sensation also were absent. The patient therefore presented the signs of a transverse lesion of the cord at about the mid dorsal region, the absolute loss of power, great loss of sensation, and the feebleness of the reflexes showed that conduction was greatly interfered with, and if the disease progressed a complete severance of the brain from the lower part of the cord was to be expected.

In diagnosis, system disease, disseminated sclerosis, and the

[11] Brit. Med. Jour., 1866.

results of acute myelitis or myelomalacia could be excluded. There remained to be considered some form of pressure paraplegia, syringomyelia, and late effects of trauma. It was felt that a study of the history could alone give any indication as to the nature of the lesion and it will be remembered that sudden paralysis of one limb (the right) was a striking feature. Though a sudden paraplegia not infrequently occurs in the course of tuberculosis of the spine its cause is either an increase in the pressure or a softening of the cord itself; it appeared unlikely that either of these conditions would account for a sudden hemiparaplegia. On this account, together with the absence of local signs in the bones or of constitutional symptoms, caries was excluded. New growths and other forms of pressure had therefore to be considered. The absence of pain was against the diagnosis of extramedullary lesion, though, as already mentioned, not conclusively so. The sudden right hemiparaplegia indicated a vascular origin as its cause, and together with the subsequent slow paralysis of the left limb suggested an intramedullary growth and this was thought to be a glioma. Gliomatous formations are met with in two conditions in the spinal cord—viz., (1) the central primary glioma probably a congenital lesion and which may remain clinically latent or reacting to various conditions, notably traumatism, may evolve and produce the characteristic *progressive* features of syringomyelia; and (2) the glioma of the spinal cord, according to Schlesinger, the commonest intramedullary tumour. It varies greatly in size, it may be small or occupy the greater part of the transverse section of the cord. Its vertical extent also varies considerably. It is often unilateral in position so that the cord looks as if it were the site of an extramedullary tumour. The growth may completely replace the structure of the cord. It is rarely sharply defined, is grey-red or grey-brown in colour, and often shows cavity formation, thus presenting the greatest resemblance to syringomyelia. The vessels of the glioma often degenerate and give rise to hæmorrhage.

The hypothesis of hæmorrhage into a gliomatous tumour or into a cavity in the cord seemed the best explanation of the facts of the case and the findings at the operation are consistent with this view. The possibility of hæmorrhage into a syringeal cavity has been urged by Sir William Gowers on clinical evidence. Although the relationship between glioma formation and syringomyelia is a very definite one I consider this name must be reserved for the special and well-defined clinical picture of a progressive disease. So also cavities in the cord may arise as the result of several conditions other than syringomyelia.

What was the connexion, if any, between the injury and the patient's illness? Cavity formation and hæmorrhage as the results of trauma are well known, but such lesions as the *primary* effect are not consistent with the long period of freedom from palsy and its sudden accentuation nearly four years after the injury. On the other hand, that injury may be the factor which determines the growth of a glioma in the brain is admitted and is probably equally true in the case of spinal glioma. It is often maintained that injury is only a potent factor if there is a pre-existing excess of glial tissue. This may be, but the importance of the part played by injury is not diminished. At the operation a tough pellicle was found outside the dura mater evidently of inflammatory origin; hence the conclusion is reached that the injury was the cause of the patient's symptoms, that the pains were due to bruising of the meninges, and that at the same time a gliomatous formation started in the cord and that the growth gave rise to few symptoms until a hæmorrhage occurred into its substance.

The surgical treatment and findings at the time of operation on May 15th, by Mr. MONSARRAT.—An incision was made from the fifth to the tenth dorsal spines. The laminæ of the sixth to the ninth vertebræ were displayed and the four spines clipped through at their bases and mobilised. The laminæ of the seventh vertebra was sawn through, the separation being completed with forceps and subsequently the laminæ of the sixth, eighth, and ninth vertebræ were clipped through with bone scissors. No abnormality of the vertebræ was discovered and no trace of previous injury to the bones or to their posterior ligaments. The dura mater being exposed, it was seen to be overlaid by a tough film of reddish membrane under which a director could be inserted. It was raised longitudinally and stripped on either side from the underlying dura mater. The dura mater was then seen to be abnormally vascular; the spinal cord within showed dark brown in colour. The dura mater was opened but was intimately adherent to the cord and the adhesions had to be separated by blunt dissection. The dura mater was particularly adherent at the level of the seventh dorsal vertebra where it was markedly thickened by a tough yellow-white fibrous band running circularly. There was no escape of cerebro-spinal fluid; the cord bulged through the opened dura mater. On inspection the posterior columns appeared transformed into a jelly-like substance of a greyish-black colour which protruded more on the right of the middle line. The abnormal appearance extended above to the level of the lamina of the sixth vertebra and below to within a few lines of the lower border of the ninth lamina. A fine knife was inserted in the middle line at its lower limit and about two cubic centimetres of clear yellow fluid escaped and the protrusion collapsed. The knife was again inserted an inch higher but only a few drops of blood escaped. No further incisions were made. The dura mater was not sutured. Hæmorrhage was controlled throughout by pressure and the wound frequently irrigated by sterile saline solution. Four catgut sutures were inserted through the spinal muscles on each side and the row of spines with their attached ligaments in the middle line. A small drain was inserted into the lower part of the wound. Throughout the operation, which lasted one and a quarter hours, the patient was on his face with the head low. There was little shock.

Reproduction of photograph taken in October, 1907, showing the site of the scar and the ability of the patient to stand with slight support.

The following abbreviated notes of the progress of the case may be given:—

May 15th: Comfortable this evening; no pain in back, vomited several times, and passed urine involuntarily. Catheter passed at midnight. Patient kept in prone position. May 16th: A good deal of oozing and discharge of pale-yellow fluid. Catheter used. Patient

turned on to his back. May 17th: Urine passed voluntarily. Blisters on inner side of first metatarso-phalangeal joint on both feet; these were cut and dressed with picric acid. Marked spasmodic jerkings of flexion of thighs. These are more frequent than before operation. May 24th: Wound quite healed. A quantity of serum came away from the lower end of incision and firm pads were placed along whole length of wound. May 28th: Some movement of toes of right foot noticed and can voluntarily invert foot. No movement of left limb. The spasmodic jerkings are less than formerly. Sensation roughly tested and agrees fairly well with the condition prior to operation but pin prick now recognised as such on the right limb. Knee-jerks present both sides, right and left. May 28th: Voluntary flexion of right thigh. Power in toes greater. Bowels acted naturally for the first time. June 1st: Still some collection of serum under the wound, horse-hair drain inserted. More power in right limb, and left thigh can occasionally be moved. June 6th: Power in both limbs slightly greater, the knee-jerks are brisker and an extensor toe response can be obtained on both sides. Sores on the toes healing. June 13th: Power still improving, spasmodic contraction of muscles marked, especially of peroneal muscles. Action of bowel and bladder occasionally involuntary. June 15th: Plaster jacket applied from iliac crests to axillæ. June 26th: Can stand when supported; walked a few steps with help. July 1st: Patient went home.

Result of examination on Sept. 26th.—The patient has continually improved; he can now, with the help of crutches, walk 40 yards without a rest, the limbs being slowly advanced, and he states that improvement still continues. The right limb is much stronger than the left, the leg muscles, quadriceps, and psoas groups acting with fair strength. The same muscles act on the left side but slightly. He is able to rise from the sitting to the erect position. The nutrition of the muscles is good but the feet are still blue and cold, there are no sores, and the wound has perfectly healed and left a healthy scar. With regard to the reflexes both knee-jerks are exaggerated; there is ankle clonus on the right side and the ankle-jerk is brisk on the left. There is plantar extensor response on both sides. The abdominal, epigastric, and cremasteric responses are absent. There is no bladder trouble. Aperients are required for the bowels and spasmodic movements of the limbs readily occur on peripheral stimulation. As to sensation, this has altered to this extent, that on the right side over the leg and thigh there is but little deficiency. A light touch by cotton-wool, a pin prick as sharp, a pin head, hot and cold water tubes, and passive movements of the joints are fairly well recognised. The localisation of touch, "spot naming," is inaccurate. On the left side these forms of sensibility are very deficient but there is still some power of appreciating pressure by the head of a pin from that of the point but no pain arises. The upper limit of loss of sensation is at the original level and there is now a zone on the trunk and outer sides of right thigh corresponding to representation of the seventh dorsal to second lumbar segment, on which light touch is not recognised nor a prick appreciated as such. Thus sensation has greatly improved in the right leg and thigh but has diminished in degree over an area which corresponds to the extent of the surgical procedure.

Liverpool.

FURTHER OBSERVATIONS ON SALTS OF THE ALKALINE EARTHS WHICH AFFECT THE COAGULABILITY OF THE BLOOD.

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IN previous papers which have appeared in THE LANCET[1] it has been shown by Sir Almroth Wright and Dr. W. E. Paramore, Dr. G. W. Ross and myself that the carbonates and lactates of calcium, magnesium, and strontium are potent agents for increasing the coagulability of the blood when administered by the mouth to the human subject in doses ranging from 30 to 60 grains. It seemed desirable to extend this investigation by ascertaining to what extent the same property is possessed by the other salts of the alkaline earths which are available for pharmaceutical purposes and the present paper presents a further instalment of observations directed to this end. For liberty to continue this research in his laboratory my best thanks are due to Sir Almroth Wright.

The method uniformly followed in this investigation has been to administer at a fixed period of the day either to myself or others, usually patients suffering from urticaria or hæmophilia, a definite dose of the drug under trial, and then to test the resulting variation in the coagulability of the blood during a period of two or more hours. The apparatus used consisted of Sir Almroth Wright's well-known calibrated capillary tubes, into which a definite quantity (5 cubic millimetres) of blood is sucked, the tube being then immersed in water at blood heat, and the contents expelled after a measured interval of time on to blotting paper to see if coagulation has taken place. In spite of criticisms which have appeared as to the sufficiency of this method it has proved itself amply adequate for the purpose in hand, very consistent results having been obtained. In a paper on the subject in the *Biochemical Journal*, vol. ii., part 4, p. 184, C. J. Coleman rightly points out that there is a diurnal fluctuation in the coagulability of the blood of which note must be taken, and that it is particularly affected by the taking of food and drink. I have been careful from the outset to avoid this source of fallacy by limiting the period of observation to the hours from 3 to 7 P.M., the intervening time being employed in quiet sedentary work, the same rule being observed in the case of patients. The results obtained with the different salts available are given below seriatim.

Magnesium lactate.—This salt is only mentioned to say that further experience with it convinces me that it is a valuable drug for combating the accidents of hæmophilia in cases when as sometimes happens the calcium salts do not seem to act. I detailed in a former paper the case of a patient of Sir Almroth Wright who being a sufferer from hæmophilia is liable to periodical oozing of blood from his gums. This symptom has been very effectively treated during the last 12 months by doses of from 40 to 60 grains once or twice repeated either of this lactate or that of strontium. The magnesium salt has the advantage for cases of this kind in that it can easily be prepared extemporaneously by the dispenser by saturating lactic acid with magnesia, which is always available. The large dose unfits the compound for delivery in a mixture; it should be dissolved in hot water by the patient himself. The lactate is a good standard for judging other salts by, a dose of 30 grains generally producing a reduction of 30 per cent. in the time of coagulation either from 3 minutes to 2, or from 2 to 1¼.

Boro-citrate of magnesium.—This is a soluble salt said by Martindale and Westcott to have been introduced for the purpose of conveying boric acid into the bladder in cases of cystitis. Its efficiency in this respect I am unable to state, but the drug undoubtedly undergoes some dissociation in the body. It is not without effect as a hæmostatic, but I should class it as inferior to the lactate for this purpose. The following are particulars of some trials with this drug, which were repeated more than once with similar results. On one occasion 30 grains given to the patient before mentioned reduced the coagulation time of the blood from 2¾ minutes to 2 minutes and 20 seconds in the course of 2 hours, a relatively poor result. On another occasion the same dose procured a reduction in the course of 1 hour from 2½ to 1¾ minutes, at which figure the time remained until the conclusion of the experiment 1 hour later. Simultaneously the same dose was taken by myself after the coagulability of my blood had been purposely lowered by the free consumption of fruit; a reduction was obtained from 2½ minutes to 2 minutes and 10 seconds in the course of 50 minutes and to 1¾ minutes at the end of 20 minutes more, no further reduction taking place. The boro-citrate of magnesium is, therefore, not altogether inefficacious in affecting the blood but seems to present no obvious advantage; in this case, also, the bulk of the dose requires dispensing in powder form.

Magnesium carbonate.—Although the doses given by Sir Almroth Wright and Dr. Paramore amounted to 60 grains of the carbonate the usual medicinal dose of 10 grains contains magnesium equal to 23 grains of the lactate, so that the latter quantity, if suitably dissolved in the acids of the alimentary canal, is sufficient to produce a characteristic effect upon the blood. Now it is interesting to note that for a long time past it has been the custom in the treatment of urticaria and other allied affections to associate the carbonate of magnesium with the bicarbonate of sodium and potassium together with bitter infusions, remedies which undoubtedly stimulate the secretion of gastric juice. The supposition that magnesia is beneficial by saturating acids suggested to be in excess in the alimentary canal seems untenable in view of our present knowledge as to the action of these associated remedies. There can be little doubt that urticaria, for example, depends

[1] THE LANCET, Oct. 14th (p. 1096) and 21st (p. 1164), 1905, and August 18th (p. 436), 1906.

upon an effusion of serum into the tissues connected with a deficient coagulating power in the blood, though why in this instance the effusion is determined to the skin is unexplained, and that successful treatment involves an increase in this coagulating power seems well established. Therefore in this instance old empirical practice finds a justification in modern research. Though not prompt enough for treating the emergencies of hæmophilia, the continued use of the carbonates of magnesium and lime when properly associated with other drugs which procure their solution in the alimentary canal, seems quite sufficient for the treatment of other disorders of the kind indicated.

Magnesium sulphate, in strong contrast to other salts tried, seems to be quite without effect in increasing the coagulability of blood, even in non-purgative doses. This has been previously ascertained, I believe, by Dr. Paramore.

Bromide of strontium is not a convenient drug to experiment with on account of its soporific effect but seems to share with the lactate the property of increasing coagulability. Two examples will suffice. A dose of 15 grains in my own person produced a reduction from 1¾ to 1¼ minutes in the course of 1½ hours, and again on another occasion the same dose procured a reduction from 1¾ to 1½ minutes in the course of one hour, a trifling effect but corresponding to an equivalent dose of lactate.

Lactophosphate and *glycerophosphate* of lime are two soluble modifications of the phosphate of calcium which have been proposed for use in medicine with a view of more effectually introducing this substance into the economy. My experience with these two drugs may therefore be read with interest. One would have thought that as the lime in milk is principally present as phosphate and is a most important factor in the phenomenon of coagulation by rennet the same substance would play an important part in the coagulation of blood; and again, that if introduced in an extra quantity into the blood some manifest effect of its presence would have been produced. I find, however, that the lactophosphate and the glycerophosphate appear most inert bodies. I have administered them both to myself and to patients in doses far exceeding those employed medicinally with little or no effect. Experiments with the lactophosphate were somewhat cursory as the salt is not very soluble, 10 grains requiring 2 to 3 ounces of hot water for solution; doses taken in the solid form, however, of 15 to 30 grains produced no perceptible result. With the glycerophosphate more extensive trials were made; as an example of which I may record the following exhaustive test. On a certain day of the present year I took 30 grains of the glycerophosphate of lime dissolved in water at 4.40 P.M., my coagulation time being then 2 minutes exactly, and at 5.40 P.M. the time was unaltered. On the next day at 5 30 P.M. the time was 1¾ minutes, showing perhaps a trifling result from the previous day; another 30 grains were then taken, and at 6.15 the time was 1 minute 50 seconds. On the third day a third dose of 30 grains was taken at 5 P.M., the coagulation time being again 1 minute and 50 seconds, and at 7 P.M. the time was exactly the same. The figures here shown exhibit the uniformity in the rate of coagulation maintained in the blood of a healthy man, and also the great exactitude obtained with practice with Wright's capillary tubes in testing this phenomenon. A clear day was then allowed to elapse and on the fifth day of the experiment the blood was again examined, and the time found to be slightly over 2 minutes. The large quantity of 90 grains of a reputedly active salt had therefore been taken without any manifestation of what one would expect to be its principal effect. An equivalent quantity of the lactate would, as I know by personal experience, have given a very different result. Four whole days were then allowed to elapse, during which the coagulability of the blood was intentionally lowered by the free consumption of oranges, and the test was then resumed. The day after this interval the coagulation time was taken and found to be 2 minutes and 40 seconds, a condition similar to what is found in urticaria; 45 grains of the glycerophosphate were then taken at the hour of 6 P.M. and by 7.30 the time had become reduced to 2 minutes. On the next day at the same hour the remarkably short period of 1¼ minutes was recorded without any more of the salt having been taken, but on the succeeding and final day of the experiment the blood had returned to the old figure of 2 minutes. The second trial, therefore, seemed to have produced an effect, though of a moderate amount compared to the dose taken.

The conclusions arrived at with regard to the drugs mentioned in this paper being based on experiments carried out with similar thoroughness to this one, though they are not all here recorded for want of space, I feel entitled to express the opinion that these two drugs, the glycerophosphate and lactophosphate of lime, though so much vaunted pharmaceutically, are drugs which in the doses in which they are usually prescribed can have little effect if they are assimilated at all. I may add that the assumption of this large quantity of glycerophosphate, amounting to 135 grains in a few days, produced no sensible effect whatever on my internal economy, neither disturbance of digestion nor of any other function resulting. At the same time I have evidence which is not yet complete that phosphoric acid and some of the soluble phosphates have an influence on the coagulating power of the blood, at any rate in bringing it up to normal, which goes to show that if these phosphates of calcium were absorbed they would be active also in the same direction. In the course of the routine testings of the hæmophilia patient so often mentioned it was found that upon half-drachm doses of Easton's syrup which had been prescribed by Sir Almroth Wright as a tonic, the coagulation time, which was generally in the neighbourhood of three minutes, came up to normal and there remained for some weeks with prevention of the usual hæmorrhages until the effect wore off, when recourse had to be had to magnesia or some other remedy. All the samples of Easton's syrup which I have been able to analyse have contained the large quantity of the equivalent of 18 minims of the dilute phosphoric acid of the Pharmacopœia in each fluid drachm which is apparently necessary to keep the other ingredients in solution—a fact perhaps not known to those who are fond of prescribing this unpalatable preparation and which makes it decidedly injurious to the teeth. Discriminating tests showed that it is the phosphoric acid which has the effect of improving the coagulability of blood, though how it acts I am not prepared to say. Certain phosphates have the same effect, but as my observations in this respect are not complete I need refer to them no further than to say that they lead me to the conclusion that the lactophosphate and glycerophosphate of lime are so comparatively inert because they are not absorbed as a matter of fact, though soluble in a test-tube. In this respect the alimentary canal would seem to be decidedly selective, as witness the case of the sulphate of magnesium.

Of the salts of the alkaline earths my conclusion is that none come up to the lactates and chlorides and carbonates if duly assimilated, and that we should rely on these for the treatment of hæmophilia. For urticaria and conditions of general debility there perhaps is a larger selection. It may be noted that the relation of lime to magnesia in the serum of blood is about that which is maintained in natural calcareo-magnesian waters—that is, the lime is to the magnesia as 2 to 1. Hammarsten's "Physiology," English edition, p. 201, gives a table which shows that the amount present in various serums is very constant, ranging from 0·06 to 0·09 per 1000 parts for the calcium, and 0·02 to 0·03 for the magnesium. In the complete blood, for which I have not been able to find any analyses distinguishing these two bases, the amounts must be larger, though doubtless in the same proportions, as they are both probably ingredients in the clot. A little more light on this subject would be useful; as anterior to the researches which have been carried on in Sir Almroth Wright's laboratory I am not aware that any one had found a use for the magnesium present in the blood in a quantity which relatively is large. Doubtless strontium is able to replace either of these bases when deficient, in a manner conformable to its chemical relations, and so is not toxic, though not a natural ingredient of the body.

Gloucester-road, S.W.

A CASE OF ECHINOCOCCUS DISEASE.

BY ALICE M. SORABJI, M.B., B.S. LOND.,
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THE patient was a Mahomedan woman, aged about 29 years, who came to the Victoria Zenana Hospital, Delhi, complaining of enlargement of the abdomen. The history of the case (as such histories generally are in India) was untrustworthy, but it appeared that she had had some enlargement for four years. A year before admission she had given birth to her fourth child. Since then the abdomen had been increasing in size up to the time when treatment at hospital was sought when it was very much enlarged and tense, the

umbilicus being unfolded and the patient being unable even to sit down with comfort. Large veins were visible over the swelling and the skin was stretched to what looked like the cracking point. The patient was emaciated and she looked haggard and had an anxious expression. Breathing and movement were alike impeded and painful. She had come from a village 14 miles away, but the idea of staying at the hospital proved so objectionable to her that she returned to her home. In a week she came back again begging to be admitted. She was in great distress, could scarcely breathe, and movement was all but impossible. The abdomen was apparently larger than before. The fulness extended to, and filled out, the flanks and went down to the pelvis so that it stood out from the lower ribs which were pressed out and hung over the pelvic bone. The tension was so great that no organs could be palpated. The heart was displaced; the apex beat was heard best in the second space three and a half inches from the mid-sternal line. The lungs on percussion were found to be squeezed into a contracted space at the upper part of the thoracic cavity. From the third rib downwards it was not possible to distinguish lung sounds as the tumour occupied the whole space. The pulse was running and weak and the patient was too ill for any exhaustive examination to be made. She was in such distress that a preliminary tapping was done and four quarts of a greenish-yellow slimy fluid were withdrawn. Unfortunately this was thrown away before examination. The vaginal vault was found to be bulging downwards and full; and the uterus was pushed down, but was normal. No other organs could be distinguished. Dr. Jenny C. Müller of St. Stephen's Hospital, Delhi, was called in, in consultation, and a laparotomy was decided upon, the provisional diagnosis of ovarian cyst having been made.

Four hours after tapping the abdomen was full and taut again. On the next day the patient, having been duly prepared and presenting a more favourable condition with a slightly better pulse, was operated upon. The ordinary incision was made in the abdominal wall. When the skin and fascia, &c., had been divided it was found impossible to pick up and to divide the peritoneum. Indeed, the usual appearance of the peritoneum was not to be seen. Instead, a thin dull layer closely adherent to a thick tough wall was found. It was not possible to separate the two, so the thick wall was incised. It was at least a quarter of an inch thick and very tough. Its inner surface was rugose. On incision a large quantity of the greenish-yellow glairy fluid escaped. On inserting a hand into the cavity thus opened several round tumours were encountered. They were slimy balls filled with a transparent opalescent fluid. They varied in size from that of a pin's head to the dimensions of a football. They occupied the cyst from the level of the third rib down into the pelvis. The cyst contained several pockets separated from each other by strands of connective tissue which were broken down with difficulty. 200 cysts were counted and at least as many more were found burst or escaped in the fluid used to wash out the cavity. The burst ones had their walls rolled up in scrolls and were in some cases packed away under the bigger cysts. The walls were slimy and transparent and varied in thickness with the size of the cyst. The bigger cysts showed daughter and grand-daughter cysts. On the lining membrane were found scolices on subsequent microscopic examination. The fluid was opalescent and had a faint odour. It took some time to empty all the pockets, as they were up in the thorax and against the posterior wall. An attempt to separate the peritoneum from the thickened cyst wall was unsuccessful, nor was it possible to determine the seat of origin of the cyst, though the liver was suspected. The cavity was well washed out with saline solution and a drain left in in the lower part of the wound. In two days the heart came down and the apex beat was heard and felt in the fourth space; gradually the other organs resumed their usurped positions. The cavity was washed out daily with saline solution and a drain left in. At first this was a long tube, later a gauze drain was sufficient. Three weeks after the operation the patient had a rise of temperature, following on a couple of days of malaise. The wound had an unpleasant sweetish odour. In the daily dressing another cyst was found and evacuated. It came from the left lobe of the liver. The patient improved steadily till five weeks later, when she had a similar rise of temperature with extreme tenderness in the region of the left lobe of the liver. Her breath had a sweet "apple" odour and the pound smelt the same. A brilliant green pus exuded from the wound. On microscopic examination this showed the bacillus pyocyanus. As saline solution alone was used for her daily irrigating and an iodoform dressing applied it was found impossible to account for this. She was put on alkalies and improved rapidly; the wound was cleaned out. The cavity continued to diminish in size. Four months after the first operation a second was done as white cyst-wall material was seen in the discharging sinus. This was scraped. The patient then improved without a break. She was given hæmatogen for a time but soon was in such splendid condition that she was able to do without it. The cavity closed entirely, the patient put on flesh rapidly, and went home looking 20 instead of 50 as she did on admission. She came from a village and described her hut and surroundings as being occupied by dogs, sheep, and cattle, as well as her family. The open stream from which they got their water was common to men and beasts.

Delhi.

SUDDEN AND COMPLETE INVERSION OF THE UTERUS: ITS PROBABLE CAUSATION.

BY ARTHUR MAUDE, M.R.C.S. ENG., L.R.C.P. LOND.

COMPLETE inversion of the uterus is so rare that its occurrence justifies notice and some remarks on the subject. I was hastily summoned to a young woman in labour of her third child. The so-called "midwife" in attendance realised that something serious had happened but had no idea of its nature and thought that the patient was dead. She was nearly so, having no pulse at the wrist and being in a state of almost complete unconsciousness from shock. There had been very severe hæmorrhage but it had almost ceased when I arrived. The uterus was completely inverted, lying quite outside the vulva. The cord had been separated near the umbilicus but was not abnormally short. The woman was in such a pool of blood that it was not easy to realise what had happened in a few seconds; the point that gave me the clue at once was the feel of the round ligaments on each side, which were dragged right down to the most external part of the uterus, which was the fundus, capped by the placenta. Two important points I noted without at the time realising their importance. First, that the cord was thin and frail; if traction had been made on the cord sufficiently powerful to invert the uterus it is probable that it would have broken close to its placental attachment; this it had not done and I regard its condition as better evidence that undue traction had not been employed than the statement made (in answer to my questions) by the midwife that she had not employed it. Secondly, the polar position of the placenta was absolute; the placenta lay attached to the inverted fundus as if it had been placed by design in the axis. This observation is confirmatory of the view expressed by Hennig[1] many years ago that the active cause of this disaster is an absolutely polar attachment of the placenta.

The history of this case as given by the midwife and afterwards by the patient was that the labour had been quite natural and rather rapid. There was no straining effort or unusual position assumed by the mother during labour. Both women agreed that the child, which presented head first, was born rapidly at the last and that the placenta and uterus came out together immediately after it. I found the placenta very large and adherent except at the edges; so, considering the very grave condition of the woman and thinking that she would stand no prolonged manipulation, I decided not to try to reduce the placenta with the uterus but to risk its detachment. I peeled it off with the left hand, gently reduced the axis of the fundus first, and, fortunately, restored the whole organ without difficulty. Having a very small hand I followed the fundus up and kept my hand in the cavity till good contractions began to become constant, which was after about ten minutes; during this time and for three hours after I kept up massage through the abdominal wall. Probably not more than a quarter of an hour had elapsed between the inversion and my arrival and dealing with it. Hence I found the spasm of the inverted ring of Bandl very slight and the ease of reduction proportionate. There was no serious amount of hæmorrhage after the uterus was restored to its proper position. It is unnecessary to detail the treatment for shock and loss of blood employed.

[1] Ueber die Ursachen der Spontanen Inversio Uteri, Archiv für Gynäkologie, Band vii., p. 491.

The value of this case depends on the points to which attention has been directed; the inversion was complete; the position of the placenta and its large size, coupled with the absence of evidence of artificial production, tend to support the theory of Hennig to which reference has been made. The patient made an excellent recovery and there was no tendency to secondary chronic inversion.

Complete inversion of the uterus is extremely rare. Braun had never seen a case in 150,000 births. In Ramsbotham's tables of 50,000 births the accident is not even mentioned, and it seems doubtful if in 1847 it had even been recognised. From 1745 to 1880 at the Rotunda in 191,000 deliveries it had only once been observed.

Westerham.

ON BLOOD COAGULABILITY IN THE PUERPERAL STATE.

BY R. HINGSTON FOX, M.D. BRUX., M.R.C.P. LOND.,
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THE object of this paper is to record observations made on the coagulation time of the blood in the puerperal condition. The observations were made by Wright's method, modified by the author, and a correction has been introduced for temperature.

Method.—Sir A. E. Wright's apparatus is described and figured in THE LANCET of Oct. 14th, 1905, p. 1096. I have after experience dispensed with the mercury, the segmentation of the tube, and its hair-fine tapering end, and the method used by me is as follows:—

The apparatus consists of a series of capillary tubes, eight centimetres in length, and each of such calibre that five cubic millimetres of mercury fill it to the length of five centimetres; each tube is inserted, the smaller end outwards, into a short larger tube and fixed in its place in an air-tight manner by sealing wax. Rubber nipples to fit the tubes, a beaker of water standing on white paper, a spirit lamp, an accurate thermometer, and a piece of string are provided. Four of the tubes are taken in succession and nearly filled with blood from a puncture near the end of the finger or thumb. Care should be taken that the blood flows freely, as squeezing the finger is apt to cause lymph from the tissues to be mixed with the blood, leading to an increased coagulation time. Nor must the finger be ligatured, as this much lessens the coagulation period. The blood lying in the tube should not quite reach either end of it. Each tube as soon as filled is laid on the table in order by the side of the thermometer and the exact time of drawing the blood from the finger noted on paper. The finger is then wiped and the puncture closed, until after an interval of 30 seconds or more the next tube is applied and the time noted. When all four tubes have been filled the observer decides at what interval he will examine the first tube, commencing well under the expected coagulation period. A rubber nipple is applied and the blood in the tube expressed into the water. If the mass is readily diffused the next tube may be left for one or two minutes longer than the first. The process is repeated until either a defined wormlike clot is expelled, which retains its form for some seconds, or until the contents have become so dense that they are with difficulty expressed. This occurs in some cases apart from the formation of a red wormlike clot, the mass being partially diffusible in the water. The reason of this variation is probably the admixture of coagulable lymph. At present I reckon the coagulation time to be the time which elapses before either a wormlike clot is formed or else the tube is with difficulty emptied, whichever happens first. Should the nipple fail to expel the contents the string should be wound tightly around the lower part of the nipple and then persistent efforts in compressing it will generally succeed in emptying the tube. If this cannot be done the tube must be discarded. I have not found any means of cleansing a tube when once choked.

Sir A. E. Wright accounts the coagulation time to be completed before the first appearance of a shred of fibrin formation. This appearance is seen much earlier and I think may sometimes be accidental, due to the presence of a minute quantity of blood less freshly drawn or of skin tissue or other extraneous matter. It seems to me better to wait until the entire mass of blood is coagulated. As by this means we obtain a much longer coagulation period than Sir A. E. Wright's the figures are not comparable with his.

Correction for temperature.—Five observations in immediate succession were made on a healthy man, aged 22 years, whose pulse was 72, regular; arterial pressure 100 degrees (Hill and Barnard). The blood was known to have an over-average coagulation time. The tubes when filled with blood were placed in small test tubes, weighted with mercury, and plunged into a water bath of a capacity of about two litres. The water was maintained at a given temperature—viz., 40°, 50°, 60°, 70°, and 80° F. respectively—in the five observations. It had previously been ascertained that the temperature of the air within the test tubes at several readings accorded closely, in each case, with the temperature of the water in the bath. The following results were obtained. Coagulation time at 40° F., 16 minutes; at 50°, 10 minutes 45 seconds; at 60°, 8 minutes 30 seconds; at 70°, 7 minutes 30 seconds; at 80°, 6 minutes 40 seconds. On plotting these out to scale the coagulation time is seen to form a curve, the ordinates of time increasing greatly as the temperature descends towards freezing point, to which line the curve doubtless forms an asymptote. A curve has been found which closely approximates to this between the temperatures 40° to 80° F., but I have not yet obtained a formula for reducing observations to the standard temperature of 60°. This correction must therefore be made from the diagram graphically.

Observations on blood coagulability in the puerperal state.—By the kindness of Dr. W. J. Gow, physician to Queen Charlotte's Lying-in Hospital, I have made observations on the blood of eight parturient women during the first week after delivery in the wards of that hospital. All were primiparæ; unmarried, except the patients in Cases 2 and 8; the labours were normal, but in Cases 1, 3, 5, 7, and 8 they were tedious; hæmorrhage was normal; all suckled their infants, who appeared to be healthy. In Case 4 there was a trace of albuminuria and the temperature rose to 100·2° F. on the second day, the pulse-rate being 108; milk on the fifth day was rather deficient. Gonorrhœa was present in Case 1. The observations were taken between the hours of 2.30 and 6 P.M. The patients were, of course, recumbent in their beds. The results, corrected for temperature, are as follows, the period required for complete coagulation being represented in minutes:—

	Years of age.		Minutes.		Minutes.
Case 1	26	First day	4	Fourth day	6½
,, 2	25	,, ,,	5	,, ,,	8½
,, 3	22	,, ,,	5⅝	Fifth ,,	6¾
,, 4	21	,, ,,	6½	,, ,,	7½
,, 5	23	Third ,,	6½	—	—
,, 6	20	,, ,,	6½	Seventh ,,	6½
,, 7	23	,, ,,	5½	,, ,,	7½
,, 8	23	Seventh ,,	7	—	—

The observations may also be summarised as under:—

First day	Four observations	4, 5, 5⅝, 6½ minutes.	
Third day	Three	,,	6½, 6½, 5½ ,,
Fourth day	Two	,,	6½, 8½ ,,
Fifth day	Two	,,	6¾, 7½ ,,
Seventh day	Three	,,	7, 6½, 7½ ,,

Comparing these figures with many other observations taken by the same method I find that the coagulation time immediately after delivery is below the normal but not to the same extent as is commonly supposed. For I have often found a much lower coagulation time in adults, as low as three minutes or less. Five and a quarter minutes, the average time on the first day after confinement, is not therefore very low. Perhaps under the careful management of labour in the hospital the hæmorrhage is less, and so the blood coagulability is less altered on this account. It will be noticed that in every case in which two successive observations were taken the coagulation time had increased during the interval. The excretion of calcium salts in the milk tending to reduce the coagulability of the blood was probably one cause of this increase.

An observation of the coagulation time of the blood after delivery might give useful warning: of the risk of thrombosis or embolism if the coagulation time were low, or of post-partum hæmorrhage if it were high. Appropriate treatment—for example, with citric acid on the one hand or with calcium lactate and salines on the other—would rectify the condition.

I made a few observations on some of these women during the latter part of pregnancy and subjoin them for what they are worth. So far as they go, they indicate a tendency to a low coagulation time, in several cases lower than after delivery.[1] The blood during pregnancy is probably rich in nutrient matter required for the growth of the fœtus. According to Winckel, it has a somewhat diminished alkalescence and exhibits a more ready (*mässige*) leucocytosis. Bar and Daunay state that the density of the blood is diminished at the end of pregnancy but rises again after partus. My observations of the coagulation point were made under various conditions as to time of day and relation to exercise and to meals, contrasting with the even conditions attaching to those made in the wards of the hospital.

Observations on the Same Cases during Pregnancy.

Case 1	11 days before partus	4½ minutes.	
,, 2	18 ,, ,,	,,	2⅝ ,,
,, 3	31 ,, ,,	,,	2½ ,,
,, 6	54 ,, ,,	,,	7½ ,,
,, 7	47 ,, ,,	,,	4½ ,,

I have not found any reference to the coagulability of the blood in pregnant or puerperal states in recent works on obstetrics, British, French, or German.

Weymouth-street, W.

[1] Compare Dr. Blair Bell's reference to the presence of large quantities of calcium salts in the systems of pregnant women, Brit. Med. Jour., April 20th, 1907, p. 921.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A NOTE ON TWO CASES OF ACRANIAL FŒTUS.

By JAMES PIRIE, M.A., M.D. ABERD.

ON Oct. 12th, 1907, a woman, aged 43 years, was delivered of an acranial fœtus. The entire vault of the cranium was absent and the floor of the gap thus caused was formed by the basilar process of the occipital bone. The scalp was intact and formed a coil on the top of the vacuity. The brain was almost entirely absent but the medulla oblongata was present. Along with a rudimentary pons Varolii several of the cranial nerves could be recognised at the base of the gap. On Nov. 7th a woman, aged 38 years, in the same village, was delivered of a similar fœtus which also showed a spina bifida. Both fœtuses were otherwise well nourished and not malformed in any other way. The former one was extremely large and weighed 10½ pounds.

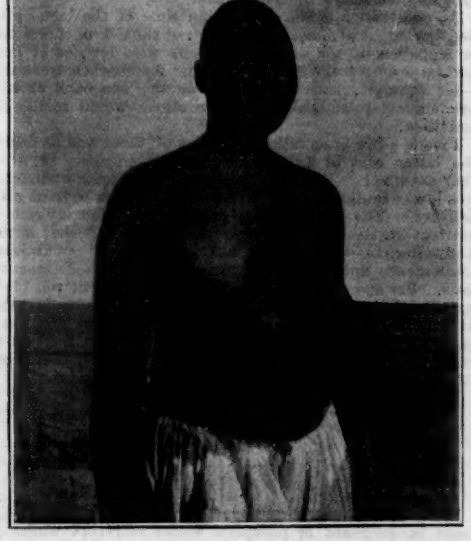
An interesting feature, and adding to the extraordinary nature of the coincidence of time and place, was that both mothers had very large goitres, and one at any rate had taken a great number of a certain advertised pill warranted to remove "female irregularities."

Harbury, Leamington Spa.

HERMAPHRODISM

BY E. S. CRISPIN, M.R.C.S. ENG., L.R.C.P. LOND.,
SENIOR MEDICAL OFFICER, RED SEA PROVINCE.

THE accompanying illustration is a reproduction of a photograph of a case of hermaphrodism and may be of some interest to readers of THE LANCET. I am unable to say if it is a case of true hermaphrodism or false, most probably the latter, of the masculine type. The patient's features are masculine; he has enormous breast development, as is well seen, but without any known secretion of milk; his pelvis is



of a masculine type. His genitals consist of a very small penis with complete hypospadias. The scrotum is cleft with a very small testicle (?) in each half. He informs me that he has been married some time and is able to perform the act of coitus but has no children. His voice is distinctly falsetto. He was engaged in work as a male messenger.

Port Soudan, Red Sea.

A CASE OF GANGRENE CAUSED BY THE APPLICATION OF CARBOLIC ACID.

BY A. C. D. FIRTH, M.A. CANTAB., M.R.C.S. ENG., L.R.C.P. LOND.,
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As cases of gangrene caused by carbolic acid are now somewhat uncommon the following case is of some interest.

The patient was a thin, anæmic girl, aged 16 years, who while at work on Nov. 20th, 1907, ran a wooden splinter a short way under the nail of the right ring finger. The splinter was extracted and a carbolic acid compress of uncertain strength was applied to the finger at the factory in which the girl was working. The compress was applied at 8 30 P.M. and remained on until 11.30 A.M. on the next day, and after removal the finger was found to be cold, white, and anæsthetic. There was no sensation of tingling or numbness while the compress was applied to the finger. On the 23rd discolouration began and the girl attended the West London Hospital for the first time on the 25th. On that occasion the skin as far as the proximal interphalangeal joint was black and insensitive, the last two phalanges being in a state of dry gangrene, of which the line of demarcation was apparently well established. No carboluria had been noticed. The finger was disinfected as far as possible and wrapped in dry dressings, but these precautions failed, the gangrene became moist, and it was eventually found necessary to amputate the finger at the metacarpo-phalangeal joint.

This condition, although described in all the text-books, is comparatively rare, as the public have learnt, in many cases, the dangers of applying carbolic acid in this manner as an antiseptic "precaution." No doubt the unfortunate person who applied it in this case will spread the warning as widely as possible.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

OBSTETRICAL AND GYNÆCOLOGICAL SECTION.

The Supports of the Pelvic Viscera.—Exhibition of Specimens.

A MEETING of this section was held on Dec. 12th, 1907, Dr. HERBERT R. SPENCER, the President, being in the chair.

Dr. W. E. FOTHERGILL read a paper on the Supports of the Pelvic Viscera. He considered that the current teaching of gynæcological anatomy, while correct in a general sense, lacked that accuracy which was essential if the student was to have a real grip of his clinical work. It was generally assumed that the urino-genital organs were partly suspended by the so-called ligaments of the uterus and partly supported from below by the pelvic floor. But the perineum and the pelvic diaphragm were often seriously impaired by injury or loss of tone without any consequent change in the position of the pelvic viscera, which showed that support from below was not essential. Again, during abdominal operations the ligaments of the uterus were seen to lie loose and slack upon the subjacent structures and to have no supporting action whatever. The operation of vaginal hysterectomy afforded confirmation of these observations and revealed to the clinician the fact that the uterus was really supported by the sheaths of its blood-vessels which attached it firmly to the sides of the pelvic diaphragm. In the same way the vagina and the bladder were held in position by the sheaths of their blood-vessels, the rectum having an independent attachment to the back of the pelvis. Thus lengthening and laxity of the sheaths of the blood-vessels was the one constant and essential factor in the causation of prolapse of the pelvic vicera. Dr. Fothergill considered that while gynæcologists were well aware of these facts they refrained from teaching them, because they borrowed their anatomical statements from the writings of professed anatomists. He therefore went on to show by quotation from recent papers by anatomists of the first rank that descriptive anatomy had changed in a way exactly parallel

to that in which clinical gynæcology had moved. The utero-sacral ligament was a mere peritoneal fold; the broad ligament was simply a mesosalpinx and mesovarium. The round ligament was a vestigial structure, the homologue of the gubernaculum testis, which pulled down the ovary and uterus in early fœtal life, and by no means supported them during post-natal life. The superficial perineal muscles derived from the primitive sphincter cloacæ had a sphincteric and not a supporting action. The muscles of the pelvic diaphragm were vestigial structures, being the degenerated representatives of the powerful tail-moving muscles of lower vertebrates. Their muscular action was largely lost; but, by virtue of their position, they, with their fascial coverings, formed the funnel-shaped musculo-membranous structure known as the pelvic diaphragm. This could not support the plastic pelvic viscera, either by its shape or its muscularity, if the pelvic viscera were not firmly attached to its sides. The conception of the pelvic fasciæ as independent and definite structures must be given up, and the fasciæ must be regarded simply as the connective-tissue coverings of the muscles, the viscera, and the blood-vessels. The vessels and their sheaths, together with the ureters, nerves, and lymphatics, formed masses of tissue which extended between the sides of the pelvis and the lateral aspects of the uterus, bladder, and vagina, and which held these structures in position. The rectum was independently attached to the back of the pelvis, and lay loose in a channel between the vessels of the right and left sides. It was free from the urino-genital organs and did not descend with them in prolapse unless the anterior rectal wall was pathologically adherent to the posterior vaginal wall.

The PRESIDENT thanked Dr. Fothergill for the interesting and lucid communication which he had brought before the section. Although the question of the support of the pelvic viscera was one to be settled by anatomical research, anyone who had performed total abdominal hysterectomy and had noticed the "ligamentum transversale colli" which lay at a lower level than the uterine artery and was very dense in structure, would find it difficult to accept the statement that it was the sheath of the vessels which kept the uterus in place. Also, how could the bladder be kept up by the sheath of the vessels which were small in number and size?

Dr. AMAND J. M. ROUTH congratulated Dr. Fothergill on his lucid and excellent discourse and felt that it would be greatly to the advantage of both students and gynæcologists if the antiquated views so long held on the subject of the uterine supports were replaced by those now elaborated. He thought that Dr. Fothergill had succeeded in proving his contention that the uterus was mainly supported by the perivascular connective-tissue bundles above the pelvic floor. He had put into words much of the scepticism which gynæcologists had held as to the acceptance of the orthodox views. No one who was in the habit of opening the abdomen and of seeing the flaccid broad ligaments and the redundant circuitous round ligaments could hold the view that these structures supported the uterus, whatever might be thought of the functions of the utero-sacral ligaments. He had long held the view that the connective tissue in the bases of the broad ligament and utero-sacral folds (which really unite and form one common connective-tissue bundle at their junction with the supra-vaginal cervix) were very important agents in holding down the uterus to the floor of the pelvis. If in amputating the cervix per vaginam these bundles were cut through, the freed uterine body could not only be easily drawn downwards by traction but would be spontaneously elevated behind the pubes if not held down by vulsella forceps. He thought, therefore, that the bundles of connective tissue grouped round the vessels and the ureters served rather as anchors to fix the uterus down to the pelvic diaphragm, preventing undue mobility both upwards and downwards. The normal anteversion of the uterus was doubtless maintained, according to Dr. Fothergill's view, by the perivascular sheaths suspending the supravaginal cervix from a direction upwards and backwards (in the erect position), much in the same way as the utero-sacral folds had been hitherto supposed to act. He hoped that Dr. Fothergill's views would receive general attention and acceptance.

Dr. R. H. PARAMORE disagreed with what had been said by Dr. Fothergill. In determining the position of the uterus and the maintenance of this position in the pelvis they had to consider not only the structures which united the uterus to the pelvic wall and the pelvic floor itself but also the intra-abdominal pressure which had a definite influence upon the position of the pelvic viscera. The intra-abdominal pressure depended upon the capacity of the abdomen, the volume of the abdominal contents, and upon the condition of the contraction of the muscles which enclosed and formed its boundaries. Dr. J. Matthews Duncan had laid stress on the retentive power of the abdomen and had drawn attention to the fact that the uterus did not alter its position as a result of complete rupture of the perineum alone, but if prolapse occurred other factors had come into play. In women with an undamaged pelvic floor and in whom the intra-abdominal pressure was much increased by a deposit of fat in the omentum or mesentery, the uterus was often found high up owing to the activity of the levator ani muscle. If in such cases the pelvic floor was damaged by childbirth, an inevitable prolapse resulted.

Dr. BRIGGS believed that too much was attributed to ligaments. The muscular and tendinous and other fibrous tissues around a joint controlled its security and mobility and produced its stiffness. The ligaments of the pelvic viscera were insignificant compared with the mass of the muscles and their fascia, the fibrous packing between, and the fibrous envelopes of, the viscera and canals.

Sir ARTHUR V. MACAN said that the importance of the pelvic connective tissue was pointed out years ago by W. A. Freund and more recently a firm band in the lower part of the broad ligament at each side of the cervix had been differentiated by Kocks under the name "pars cardinalis ligamenti lati." The effect of taking away the support from below could often be observed clinically in cases where prolapse of the anterior vaginal wall followed rupture of the perineum. As the vaginal wall prolapsed it drew the cervix downwards and forwards which produced backward displacement of the fundus and, finally, prolapse. Prolapse of the uterus was also met with in old women due to senile atrophy of the pelvic connective tissue removing the natural support of the pelvic organs. The strength of the support from below was, he thought, well shown by the resistance which the pelvic floor offered to the expulsion of the child's head during labour.

The following specimens were shown:—

Dr. C. HUBERT ROBERTS: A Cancerous Uterus and Glands removed by Wertheim's Method.

Dr. PETER HORROCKS: Tuberculous Disease of the Cervix.

Dr. JAMES OLIVER: A Somewhat Unique Tubal Gestation.

Dr. LEWERS: Sarcoma of the Ovary complicated by Carcinoma of the Body of the Uterus; Operation.

DERMATOLOGICAL SECTION.

Exhibition of Cases.

A MEETING of this section was held on Dec. 19th, 1907, Dr. T. COLCOTT FOX being in the chair.

Mr. G. W. DAWSON showed a case for diagnosis. The patient was a woman, aged 33 years, who had had for the past six years an affection of the skin which had slowly spread from the palms and soles to occupy the forearms and legs. These parts were reddened, slightly thickened, and scaly, presenting a finely rugose surface. The diagnosis was not clear.

Dr. COLCOTT FOX showed a woman with Verrucose Granulomatous Swellings on the Upper Lip, the Nose, the Chin, and Nasolabial Furrow. These had persisted for three months. There was no history of syphilis or tubercle and she had not been taking any drugs that could be held responsible for the appearances. A yeast-like fungus had been found in scrapings, and the possibility of its being a case of blastomycosis was suggested.—Others contended that it was a verrucose syphilide.

Dr. E. G. GRAHAM LITTLE showed: 1. A case of Favus of the Scalp and Nail in a woman, aged 40 years, who had never left England and was a native of Essex. Very numerous and typical scutula were seen on the scalp and the fungus was readily found in the hair. A nephew, aged eight years, living in the house had apparently contracted the disease from the previous patient and when shown had very numerous pityriasic and alopecic patches, the result of the disease on his scalp. 2. A case of Bazin's Disease of unusually rapid development in a young woman, the legs having numerous deep-seated ulcers and nodose swellings which dated from only two months previously. There was no history of pulmonary tuberculosis and the tuberculo-opsonic index was 0·96 on the single occasion on which it had been examined.

Dr. J. M. H. MACLEOD and Mr. E. TREACHER COLLINS (introduced) showed: 1. Three cases of Keratosis Follicularis

associated with Baldness, the patients being brothers aged 19, 13, and 10 years respectively. All three cases showed plugging of the hair follicles in various parts of the body, a general but mild ichthyosis, absence of inflammation round the spiny plugs, and no atrophy. 2. A case of Bazin's Disease in a woman, aged 21 years, in whom a positive reaction had been obtained with an injection of Calmette's tuberculin solution into the conjunctiva.

Dr. J. H. STOWERS brought forward again the patient with a Granulomatous Tumour of the Cheek shown at a previous meeting. The tumour had greatly diminished in size as a result of the application of mercurial plasters.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

Ankylostomiasis in Australia.—Physaloptera Mordens, a New Parasite of Man.—The Part played by Metazoan Parasites in Tropical Pathology.

A MEETING of this society was held on Dec. 20th, 1907, Sir PATRICK MANSON, the President, being in the chair.

Dr. T. F. MACDONALD read a paper on Experiences of Ankylostomiasis in Australia. He said that tropical medicine had recently assumed an entirely new importance owing to the advent of workers of the white race in tropical industries of North Queensland. He found ankylostomiasis among the inhabitants of the Johnstone River district (which is situated between Townsville and Cairns) when in 1895 he commenced practice there. Planted in the heart of a jungle of scrub 60 miles square, with a rainfall of 200 inches and with frost unknown, those were ideal conditions for the incubation of parasites; and there ankylostoma duodenale spread from family to family. After his first reports as to the magnitude of the infection in his own district Dr. T. L. Bancroft of Brisbane was good enough to keep him posted with all the latest papers on the subject, among others those of Dr. Looss of Egypt, after which the advice to "use earth closets and wear boots" became an aphorism. He appealed to municipal authorities but without success. The happy thought struck him to enlist the sympathetic assistance of the Bishop of North Queensland, who, much to his credit, entered heart and soul into his proposition that a school of tropical medicine and research institute should be established in Townsville. Quite recently the Federal Government had voted the necessary funds for that purpose and he should await with much interest the contradiction or confirmation of his statements concerning ankylostomiasis in Australia. As to the disease itself, among children the most pronounced symptom was the extraordinary appetite displayed for eating earth, not in casual manner but under the impulse of an irresistible craving. Babies would pick dirt from the seams on the floor or from boots carelessly left uncleaned; older children frequently expressed a desire to suck stones, preferring such luxuries to sweets. Adults did not eat earth but developed abnormal delights in pickles, curries, and alcohol. Quite the most interesting feature of the clinical aspect of ankylostomiasis was to him the recognition of a series of, so far as he knew, unrecorded psychopathological symptoms characterised by, so to speak, a "spectrum" of deeper and deeper immoral qualities, growing and strengthening with the progress of the disease. It was difficult to determine whether there were *per se* vicarious appetites of the moral and mental systems parallel to those of the physical order, or if the moral and mental aberrations to be observed in an outbreak of that disease were merely accidental. His own belief was that they were as definite symptoms of positive nerve poisoning as anæmia was of blood destruction. Later stages of degeneration were of the sexual order. Schoolmasters had consulted him as to the cause of general demoralisation among school-children. Thymol provided a key to the difficulty, with, he was glad to say, happy results. Two factors were necessary, in his opinion, to produce effects of that nature: (1) a weakened physiology of the victim; and (2) an exciting nerve toxin. That part of the work he intended to follow up in one of the laboratories of Europe and possibly might have more to say on the subject at some future date. At present the matter was too much in theory; but still, clinical indications were very strong in showing that there might be a rational explanation of child immorality. Australia had been infected by ankylostomiasis through three distinct channels—by South Sea Islanders, Arabians, and Italians. In all probability the natives of Australia were affected by that parasite before the advent of the white race, for it might be found among them now, and several outbreaks had been recorded. It was comparatively an easy matter to treat individuals, but how to stamp out the disease in communities was the question they still had to face. In his district, being a medical officer to the general hospital as well as to the surrounding plantations, with special local hospitals, he had a good opportunity of testing the strength of that disease when thoroughly engrafted into a community. During that time the farming class passed through a transitional period from almost poverty to great prosperity, and advantage was taken when new farm-homes were being built to treat all members of the home with thymol within a week, to disinfect as thoroughly as possible, and finally to burn old houses. In that way many centres of infection were for the time being obliterated but new centres quickly arose. Still, with reasonable assistance from society, whether by way of Government grants or voluntary contributions, the outlook was far from hopeless. The treatment of definite "contacts," whom he should classify as those staying under the same roof, was an important matter in checking the development of community infection.—Dr. L. W. SAMBON said that the investigations of Tirelli in Sicily had proved that in mines in which the drainage-water was fresh ankylostomiasis was very prevalent, but that when the percentage of salt in the water was high, as was the case in many mines, there was no ankylostomiasis among the workmen. Experiments were being made to see if the disease could be checked by rendering the drainage-water in mines salt.—Dr. F. M. SANDWITH said that thymol was not a safe treatment for the old or the very young. He pointed out that it was better to give 30 minims of oil of eucalyptus with ten drachms of castor oil and 45 minims of chloroform. He asked Dr. Macdonald what was the age of the youngest patient he had seen with ankylostomiasis.—Dr. R. T. LEIPER mentioned that in Uganda the special kinds of earth eaten had been forbidden to be sold to the natives.—Dr. A. M. ELLIOTT said that he found it useful before giving thymol to prepare the patient by administering podophyllin.—The PRESIDENT said that he had had a favourable experience of the treatment by eucalyptus, castor oil, and chloroform. In regard to the immorality noticed in children the subjects of the disease, he quoted instances illustrating the point from his own experience.—Dr. MACDONALD, in reply, agreed that thymol was a dangerous drug and welcomed the suggestion of the eucalyptus treatment. The youngest child he had treated for ankylostomiasis was eight months old.

Dr. LEIPER then read a paper on Physaloptera Mordens, a new intestinal parasite of man in Uganda. This species was distinguished from the other human parasite of the genus physaloptera, viz., physaloptera Caucasica, as described by von Linstow, by its greater size, physaloptera mordens measuring in the male specimens 29 millimetres in length and 2 millimetres in breadth and in the female 40 millimetres and 3 millimetres respectively; in the disposition of the papillæ of the male bursa and the contrast in the size of the spicules. In the female the situation of the vulva and the smallness of the egg were sufficient to separate the two species. Lastly in the buccal armature an additional pair of teeth and two pairs of papillæ were noted.

Dr. SAMBON read a paper on the Part played by Metazoan Parasites in Tropical Pathology. He said that in recent years the elucidation of certain bacterial diseases such as leprosy, cholera, undulant fever, and plague, and more especially the wondrous discoveries made with regard to the protozoal scourges of the tropics, malaria, sleeping sickness, kala-azar, and tick fever, had so greatly occupied their minds that little attention had been devoted to the metazoan parasites as factors in the causation of exotic diseases. And yet these parasites played a most important part in the pathology of tropical countries. The part played by metazoan parasites in disease causation had not escaped the ancients. Like every other branch of medicine helminthology had its history which ran back to the remotest times of which they had any record. Dr. Sambon showed how the ankylostomum duodenale, the guinea worm, the itch mite, and other parasites were known from the remotest antiquity and their pathogenic action correctly and fully understood. Within recent years the list of metazoan parasites affecting man had been considerably enlarged, and it was of the utmost importance to

notice that some of the species which hitherto had escaped notice were widely distributed, extremely frequent, and highly pathogenic. One of the worst scourges of the tropics was without doubt the endemic anæmia, now generally known as ankylostomiasis. In 1838 Dubini discovered the ankylostomum duodenale in the duodenum of a peasant woman who died at the Ospedale Maggiore in Milan. In 1851 Griesinger showed that Dubini's worm was the cause of Egyptian chlorosis. Later, Wucherer showed that the Brazilian disease called "oppilatio" was likewise an ankylostomiasis. The world-wide distribution of endemic anæmia indicated the possibility of more than one type of disease in the various regions. In 1888 Lutz noticed that the Brazilian worm was not provided with the hooked teeth described by European authors, and Stiles in 1902 showed that the endemic anæmia of America was not, as a rule, due to ankylostomum duodenale but to a new species of the closely allied genus necator, for which he proposed the specific designation of "Americanus," believing it to be special to the American continent and the adjacent islands. Later, however, it was found by Looss in pygmies from Central Africa and by others in Assam, Burma, West Africa, and Italy, suggesting probably Africa or Asia as the original habitat. In 1905 Baillet and Henry described another new strongyloid of man which, like necator Americanus, might also be an important agent in the causation of tropical anæmia. They discovered the new parasite in the collection of the Paris Natural History Museum. It was represented by two specimens presented by Dr. Monestier in 1865 and collected at the post-mortem examination of an African negro who died from endemic anæmia in Mayotte. Another new parasite, likewise belonging to the sub-family Sclerostominæ, was the œsophagostomum Brumpti discovered by Brumpt in 1902 in Africa. Another group of parasites mentioned was that of the schistosomidæ. For a long time only one species was known to occur in man; it was the schistosomum hæmatobium, better known as bilharzia after the name of the investigator who discovered it in Egypt in 1851, and showed that it was the cause of endemic hæmaturia. In 1904 Professor Katsurada discovered a new species in Japan and called it schistosomum Japonicum. It was not recognised before probably because its ova lacked the characteristic spine of the eggs of schistosomum hæmatobium and greatly resembled those of ankylostomum duodenale with which they must have been frequently confounded. The adult parasites closely resembled those of schistosomum hæmatobium; the striking difference was the absence of cuticular prominences on the outer surface of the body of the male. Schistosomum Japonicum did not affect the bladder; its ova were eliminated by way of the intestine and frequently accumulated in the liver, giving rise to a peculiar form of cirrhosis. A third species of schistosomum was described by himself (Dr. Sambon) last summer. He called it schistosomum Mansoni, because Sir Patrick Manson had already suggested the possibility of its specificity. The material at his disposal being scarce and badly preserved, he had not been able to study their anatomical structure. He had noticed that the body surface of the male presented cuticular prominences somewhat similar to those of schistosomum hæmatobium, and he had pointed out that the differences in the structure of the female genital tract described by Fritsch as abnormal were characteristic of the new species. His determination was based chiefly, but not solely, on the characteristics of the ovum which in schistosomum Mansoni differed greatly from that of schistosomum hæmatobium not only in the position of the spine but also in the size and shape both of the spine and of the body of the egg. His determination was based also on the peculiar geographical distribution and on the peculiar anatomical habitat of the new parasite. In Egypt both schistosomum hæmatobium and schistosomum Mansoni were found side by side, but the former appeared to be more prevalent and was certainly more conspicuous owing to the hæmaturia to which it gave rise. That was probably the reason why the two forms had been confounded, the spined ova of schistosomum Mansoni being looked upon as abnormal. They must go elsewhere to become aware that the differently shaped eggs represented two different species. Thus in the West Indies schistosomum Mansoni was the only species present, endemic hæmaturia was unknown, and the parasite escaped observation until quite recently, when a systematic examination of stools for the detection of ankylostomum ova made them suddenly aware of its extreme prevalence. Schistosomum Mansoni, like schistosomum Japonicum, never affected the bladder. Its ova were deposited within the submucous layer of the rectum. They had been found not infrequently in the liver, giving rise to a cirrhosis similar to that produced by schistosomum Japonicum. A new porocephalus and some new parasitic larvæ of diptera were also mentioned. Then Dr. Sambon discussed the pathogenic action of metazoan parasites and spoke of the toxins which they produced. He drew special attention to the migrations of certain parasites in their larval or immature stages before reaching the anatomical habitat in which they were usually found, and he said he believed that such wanderings would explain much that was now obscure in the pathogeny of certain species. Until quite recently the route followed by intestinal parasites was supposed to be a direct and simple one. The eggs of the parasite were swallowed by the host. They reached the intestine with water or food and hatched in the part most convenient. Likewise maggots found beneath the skin were supposed to have been laid in the very spot by the parent fly. The true mode of entrance might be very different and complicated. At one time it was believed that hypoderma bovis, the ox warble fly, laid its eggs upon the back of cattle and that the larva immediately penetrated the skin and lived there without wandering. Now it was known that the fly laid its eggs upon the legs of cattle, especially just above the hoof. The animal licked its legs and the larva at once hatched and was carried down into the œsophagus, the walls of which it penetrated. It then wandered through the connective tissues of the host and found its way into the spinal canal. (In young cattle as many as 57 larvæ had been found distributed throughout the whole length of the spinal canal.) Ultimately it reached a point beneath the skin on the back of the animal. Another example was that of ankylostomum duodenale. Until quite recently it was believed that the so-called encysted larva was swallowed with water, food, or possibly even earth. Thus it passed straight into the duodenum. Looss had suggested another mode of entrance through the skin. According to this investigator the nematodes pass with the blood through the heart to the lungs, from the lungs to the air passages, up to the larynx, down the œsophagus to the stomach, and then to the small intestine. Looss's theory of skin infection had been thoroughly demonstrated by experiment but Dr. Sambon doubted whether the trachea-œsophagus part of the journey was more than a mere conjecture. In œsophagostomum and in other sclerostominæ which inhabited the intestine when fully mature for the purpose of fertilisation and oviposition, the immature forms before entering the lumen of the intestine were found in small cysts beneath the intestinal mucosa. Recently he (Dr. Sambon) had had the opportunity of investigating the life-history of a heterakis of the pheasant. Here again the parasite appeared in small cysts beneath the mucous membrane before entering the cæcal cavities. Many other examples were given by Dr. Sambon, some of them observed by himself, as, for instance, in the case of porocephalus armillatus. Lastly, he spoke of the agency of metazoan parasites in the conveyance and development of secondary infections. Already in 1903 and 1905 at meetings of the British Medical Association he had pointed out that probably entozoa within the alimentary canal or within the tissues performed a rôle similar to that of blood-sucking arthropoda from without conveying more minute pathogenic organisms from one anatomical habitat to another. Already Metchnikoff in 1901 had suggested that intestinal parasites might inoculate pathogenic organisms through the intestinal mucosa and thus give rise to infectious diseases. Guiart, Blanchard, and others had recently maintained that appendicitis might be brought about by the agency of intestinal worms, and more especially the whipworm. Guiart had even suggested that typhoid fever and cholera might be favoured by the agency of whipworms, tapeworms, and other intestinal parasites. Finally, Weinberg had just published a most suggestive article on the subject in the *Annales de l'Institut Pasteur*. So far they had little positive information in favour of the agency of entozoa with regard to the transmission of secondary infections, but on consideration the subject was pregnant with possibilities, and he believed the day was not far off when they would have experimental proof of the truth of this theory. In any case, whether harmful in themselves or on account of possible complications, the prophylaxis of the entozoan parasites of man imposed itself most urgently. In order to be able to prevent infection they needed to encourage and to further in every possible way the study of helminthology.

LIVERPOOL MEDICAL INSTITUTION.

Tagliocotian Skin-grafting of the Arm.—Ununited Fractures Treated by Bone-grafting.—Tabetic or Trophic Foot.—Physique and Health in the Liverpool Schools.

A MEETING of this society was held on Dec. 19th, 1907, Mr. FRANK T. PAUL, the President, being in the chair.

Mr. G. P. NEWBOLT showed lantern slides of a case operated upon by the Tagliocotian Method. The patient's forearm had been severely injured in a railway accident, both bones being broken, the skin much lacerated, and the muscles and tendons partially torn away. A long flap of skin was raised from the abdomen below the left breast and the arm was passed under it so that it lay as if in a sling. As a result of this operation, which was completed in two further stages, the arm had been saved; sensation was good and there was some movement in the fingers. The patient is still under treatment.

Mr. RUSHTON PARKER related two cases of Ununited Fracture treated by clearing out unossified tissue from between the fragments and planting in the interval small pieces of bone clipped from the seat of fracture. One case was that of a man, aged 35 years, whose left humerus had been broken six months previously and imperfectly united by incomplete callus, permitting movement and unfitting the limb for use. Union resulted in six weeks. The other case was that of a woman, aged 48 years, with total non-union of the left ulna of eight months' standing. There was pain as well as weakness and flexibility at the seat of fracture. Union was still absent in six weeks but after hammering the seat of fracture it resulted firmly a week later. The practice was based upon the principle laid down by Sir W. Macewen in his celebrated case.[1]—The PRESIDENT said that he quite accepted the truth of Sir W. Macewen's observations on which Mr. Parker had based his treatment of these interesting cases, but he did not consider that these observations contained the whole truth in reference to the development of bone. If so, how were they to explain the formation of bone in various tissues, such as arteries, where no bone cells had ever existed? The constant precursor in such cases was a calcareous degeneration. If this excited any inflammatory change the young connective tissue formed bone. Calcified arteries, cysts, tumours, &c., in this way frequently originated bone in the neighbourhood of the calcareous deposit, and he would suggest that Mr. Parker should try the effect of the presence of phosphate of lime alone, as this could be introduced without a regular operation.

Mr. T. C. LITLER JONES showed a patient both of whose feet he had amputated on account of the condition known as Tabetic or Trophic Foot. Lantern slides were shown of x ray photographs of the feet at various stages of the disease, exhibiting very clearly the progressive melting away of the phalanges without primary inflammatory changes. The patient had none of the ordinary symptoms of tabes dorsalis, appeared to be in excellent health, and could walk remarkably well on his artificial feet.

Mr. A. S. ARKLE read a paper on Physique and Health in the Liverpool Schools based on his examination of children from schools of three classes under the control of the county borough education committee and the boys of a public school. The statistics showed clearly that there was a close relation between status in life and feeding and the growth and development of the children. The influence of feeding was shown by comparing the children of industrial schools with those of the lower class of council schools. In regard to health, attention was drawn particularly to heart lesions and abnormality of the eye, ear, nose, throat, and teeth.—Professor T. R. GLYNN said that some of the facts demonstrated by Mr. Arkle's figures might have been anticipated, but others, as the small number of congenitally syphilitic children, were contrary to what might have been looked for; the explanation was in some degree the early death of the infected children. He hoped that Mr. Arkle would have an opportunity of extending his observations in other directions, such as the relative prevalence of hereditary degeneration.—Dr. E. W. HOPE mentioned that the excellent work which had been done by Mr. Arkle during the last few years gave some indication of the magnitude of the task of the medical inspection of school children. It was absolutely necessary, as the excellent Memorandum of the Board of Education pointed out, to follow up the examination by an extension of the amelioration of the sanitary condition which had already proved so powerful a factor in improving the health of children. The methods of carrying out the Act had not been decided upon and Dr. Hope expressed the belief that the views of the medical profession, if focussed and brought to the notice of the education authority, would receive every consideration at the hands of that body. He regarded the medical inspection of school children as an extremely important accessory in public health administration.—Mr. J. BARK agreed with Dr. Hope that the object of the Education Department was to prevent the occurrence in children of certain diseases which were detrimental to their physical and intellectual future. In the case of adenoids the earlier the removal was undertaken the better. The best results were obtained in children operated on between the ages of two and seven years. 90 per cent. of young children with enlarged faucial tonsils had adenoids. If the new Act was carried out efficiently the future generations would be freer from deafness and chest troubles than the present. Dental examination and treatment were most important; oral sepsis was responsible for much of the physical deterioration of the race.—Dr. A. C. WILSON, medical officer to the truant schools at Hightown, said that he agreed with Mr. Arkle that under-feeding was the great cause of bad physique in the poorer classes of children. He rarely met with congenital syphilis, and this he attributed to the infected children dying out or getting into special institutions for the deaf and dumb, blind, or imbecile, &c. The most pressing reform needed was the better care of the teeth. He was glad to say that the Liverpool education committee had recently appointed a dentist for all Liverpool schools. He believed that defective vision in children was to some extent due to the eye not being trained to distances. —Several other members having spoken, Professor GLYNN proposed, and Dr. G. G. STOPFORD TAYLOR seconded, the appointment of a subcommittee of the institution to consider and report on the Memorandum of the Board of Education. This proposal was adopted and a subcommittee was elected.

[1] Reported to the Royal Society in 1881, repeated and amplified in his lecture at the University of Liverpool in December, 1906, again related to the Royal Society in January, 1907, and published in the Proceedings of June and in the British Medical Journal of June 22nd, 1907.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Cases.

A MEETING of this society was held on Dec. 20th, 1907, Dr. J. ALLAN being in the chair.

Mr. B. G. A. MOYNIHAN showed a case of Complete Gastrectomy. The patient was a man, aged 43 years, with a two and a half years' history. At the operation, on May 31st, 1907, a condition of "leather-bottle" stomach was disclosed. The whole stomach was removed, the jejunum being joined to the œsophagus. The patient now ate well, worked as before, and had gained 3 stones in weight.[1]

Mr. MOYNIHAN, with Dr. T. WARDROP GRIFFITH, exhibited a case of Gastro-enterostomy for Pyloric Stenosis following corrosive poisoning. The patient swallowed half a pint of "spirits of salts." At the operation the pyloric antrum was found to be almost solid. Gastro-enterostomy combined with jejunostomy was performed.

Dr. A. G. BARRS, with Mr. J. F. DOBSON, showed a case of Sub-diaphragmatic Abscess and Empyema rupturing through the Lung, apparently following a duodenal perforated ulcer. Drainage of the abscess and empyema by separate operations was followed by recovery.

Dr. T. CHURTON showed: 1. A case of Acute Spinal Myelitis in a boy, aged nine years. There were absolute paralysis and anæsthesia of the legs and incoördination of the detrusor and sphincter muscles in micturition. On July 13th he fell on his back; in August the first symptom was difficulty in micturition. On the 17th signs of total transverse myelitis showed themselves. 2. A man, aged 57 years, with Heart Disease and Anuria. Theocine sodium acetate, one grain every six hours, with strophanthin, $\frac{1}{10}$th of a grain, had caused a great increase in the quantity of urine. In two former cases five-grain doses had been used; the patients both got worse. 3. A girl, aged seven years, with Partial Anuria and old Mitral Disease. Half a grain of

[1] See THE LANCET, Dec. 21st, 1907, p. 1748.

theocine every eight hours with digitalis were administered and the urine became doubled in quantity.

Mr. LAWFORD KNAGGS showed: 1. A case of Actinomycosis of the Jaw after two scraping operations. The patient had been accustomed to drive a cart laden with grain and whilst doing so to chew some of the grain. At Christmas he pulled out one of his teeth and afterwards grains would lodge in the wound and the latter did not heal. Soon after the disease made its appearance. 2. A case of Stone in the Left Ureter of 11 years' history, with removal. A median laparotomy was performed in October, 1907. The ureter was dilated and the kidney was hydronephrotic. The stone was pushed up from the pelvis to the loin. The ureter was then exposed through an incision in the posterior peritoneum and the stone was steadied by two strips of gauze slung round the ureter above and below it. In this way the ureter was temporarily occluded above and below and when the stone was expressed through a longitudinal incision no urine escaped. The wound in the ureter was closed with fine silk sutures *à la* Lembert and a drainage tube was passed through the left loin. The peritoneum was then closed over the ureter and the abdominal incision was sutured in the ordinary way. Recovery was without incident. 3. A case of Extroversion of the Bladder; Hysterectomy; Peter's Operation. The patient was a woman, aged 31 years. At four years of age she had had Wood's (?) operation performed by Mr. W. H. H. Jessop. The result had been satisfactory, the bladder wall being covered over. Her condition, however, as she grew up became one of great misery, the vulva being kept in a constant state of irritation and inflammation as a result of the dribbling of urine and the deposit of phosphates on the hair and within the cul-de-sac which had been formed by operation. Her sufferings were aggravated at the periods and on inspection the condition of the parts was very foul. On June 28th, 1907, an operation was proceeded with and six weeks later a second one was performed. The parts were now clean, there was no offensive odour, and the urine was retained for four, and sometimes for five, hours. There was a small leak from a deep pocket in the original wound area, but she kept herself quite comfortable by a small pad which she changed two or three times a day.

Dr. J. GORDON SHARP exhibited a case of Vaso-motor Neurosis with Dermographism in an undersized boy, 14 years of age. The patient had always a diffused blush over his face, which became accentuated by excitement and by stimulation of the skin. When any part of the skin of the body was written upon by a blunt instrument there followed in a few seconds a deep blush, and in a few seconds later the writing appeared as a white wheal, and remained for some time. The pulse-rate was now about 100. A thrill was felt in the mitral area, and in the same region presystolic and systolic murmurs were heard but conducted to other areas.

Dr. BARRS and Mr. H. LITTLEWOOD showed a case of Paraplegia with Sarcoma of the Spinal Meninges, in which laminectomy and removal of the growth were performed, recovery ensuing. The patient had for six months suffered from pain in the back at the level of the tenth dorsal spine, with stiffness and numbness of the right leg. There had been a rapid increase of symptoms. On admission to hospital there were found to be complete paraplegia with anæsthesia up to two inches above the umbilicus and a narrow zone of hyperæsthesia above this. Laminectomy was carried out and the tumour was removed. The patient had been shown to the society before but at that time he could only move his legs, whereas now he could walk.

Mr. LITTLEWOOD showed: 1. A case of Carcinoma of the Rectum and Splenic Flexure in a patient, aged 52 years. Colotomy was performed on Nov. 8th, 1906, but with no relief. On Nov. 14th the abdomen was opened in the middle line and a mass was found in the splenic flexure. A Paul's tube was put into the cæcum. On Dec. 6th an enterectomy was carried out and on Jan. 10th, 1907, proctectomy was performed. 2. A case of Carcinoma of the Rectum and Ascending Colon in a patient, aged 69 years, in which a polypoid malignant mass was found. On August 22nd, 1907, proctectomy was performed. The patient had symptoms of obstruction three months later and a mass was found in the ascending colon with nodules in the liver. On Nov. 14th a lateral anastomosis of the small intestine with the transverse colon was carried out and great relief followed. 3. A case of Pigmented Lymphangioma of the Foot in a patient aged 18 years.

Mr. W. THOMPSON showed a case of Actinomycosis of the Cheek and the Glands of the Neck. 18 weeks previously a swelling had appeared in the mouth which had burst externally. The patient had been in the habit of eating a little corn when feeding his pigeons.

Dr. A. WEAR showed: 1. Erythema Induratum Scrofulosorum in a patient, aged 36 years. The first appearance of the disease had occurred ten years previously, both legs being affected simultaneously, and repeated attacks had since been experienced. 2. Adenoma Sebaceum. The tumours were situated on either side of the nose.

Mr. L. A. ROWDEN and Dr. W. H. MAXWELL TELLING exhibited a case of Chronic Favus of Six Years' Duration in a Child Treated by X Rays. Only a single exposure was given on each affected area.

Dr. TELLING showed: 1. A case of Congenital Hypotonia (or amyoplasia) in an infant, aged one year and nine months. Since birth the hands and feet had been noticed to be very soft; these especially, and the limbs and skeletal muscles generally, were markedly flaccid and toneless, allowing considerable bending at the joints. The patient had been under continuous observation for 15 months with no notable change in the muscular condition. 2. Subacute Tylosis of the Nail-matrix. The condition had commenced about three and a half months previously in one finger and rapidly spread to all the other fingers. There was a dry warty overgrowth at the distal margin of the nail-bed which was lifting up the nail and spreading to the root in a V-shaped manner.

Dr. E. F. TREVELYAN showed: 1. Five cases of Peripheral Birth-palsy, illustrating lesions of the brachial plexus. 2. Brown-Séquard Paralysis in a woman, aged 47 years, who had been stabbed in the back in August, 1907. On Oct. 4th a scar was seen in the neck to the right of the third cervical spine. There were motor paresis of the right arm and paralysis of the right leg and a considerable sensory loss on the left side. The patient was improving.

Dr. ALEXANDER SHARP showed a case of Fibroma of the Larynx.

Mr. A. L. WHITEHEAD exhibited a case of Congenital Left-sided Ptosis treated by Plastic Operation.

Mr. MICHAEL A. TEALE showed: 1. A case of Staining of the Cornea of the Right Eye following an extensive hæmorrhage into the anterior chamber. 2. A boy showing a Congenital Coloboma of the Right Iris directed upwards and inwards.

Cases were also shown by Dr. A. BRONNER, Mr. H. SECKER WALKER, and Mr. ALEXANDER SMITH.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Cases.

A MEETING of this society was held on Dec. 18th, 1907, Dr. JAMES RITCHIE, the President, being in the chair.

Dr. ALEXANDER BRUCE showed the following patients. 1. A woman suffering from Myasthenia Gravis. She became fatigued on the slightest exertion and after climbing a stair she was completely collapsed. No muscular atrophy was present and there was no reaction of degeneration in the muscles, but the myasthenic reaction to electricity was present—i.e., the muscle soon ceased to respond to electrical stimulation. 2. A woman suffering from Amyotrophic Lateral Sclerosis. This was essentially progressive muscular atrophy along with lateral sclerosis. The patient also showed bulbar phenomena. The condition had lasted barely two years. Atrophy of the left hand and arm was marked, the right extremity not being so advanced. The facies was peculiar, the lips were tightly compressed, and there was difficulty in protruding the tongue. 3. A woman exhibiting Neuritis of the Left Median Nerve. She had pricked her hand with a needle last July and subsequently a diffuse cellulitis of the front and back of the hand developed with pain along the course of the median nerve which was followed by desquamation of the skin in this area. At present there was tenderness over the whole of the left arm with tactile anæsthesia over the whole area of distribution of the nerve, while marked hyperalgesia was present over this area. There was involvement of the roots of nerves of the cervical plexus and this extended as far down as the fourth dorsal nerve. The muscles of the left shoulder were atrophied.

4. A woman who easily became very emotional and this was associated with a Clonic Spasm of the Right Hand. The right eyeball was prominent and the right side of the face was also enlarged. When she cried tears flowed most abundantly from the right eye and she also perspired more freely on this side of the face. The right side of the thyroid gland was somewhat enlarged. The condition was consequent on removal of both ovaries on account of double ovaritis. 5. A man who suffered from the rare spasmodic form of Syringomyelia. In February, 1907, he had an attack of numbness of the left arm and suddenly the second and third fingers became flexed firmly on the palm and since then they could not be extended. The wrist, the elbow, and the shoulder-joint were also fixed. Over the left shoulder there was a large swelling and the whole tissues on the left side of the thorax were tough and firm as compared with those on the right side. There was loss of sensibility to heat and cold along the inner side of the left forearm.

Professor JOHN CHIENE said that he was not satisfied with any of the methods of treating Congenital Wryneck. In a recent case he had operated by turning down a flap of skin and tissue on the side of the contracted muscle over the mastoid; he had then stripped off the periosteum from the mastoid process and so freed the upper end of the sterno-mastoid muscle. He had attached the upper extremity of the detached periosteum to the apex of the mastoid process and had thus elongated the muscle on the shortened side. The result had been excellent. He demonstrated the case of a young man who had been incapacitated for work by reason of a loose body in his left elbow-joint which caused the joint to lock. The operation consisted in turning down a flap of skin from the back of the elbow above the joint and splitting the triceps after which an excellent view of the interior of the joint was obtained and a large loose body was removed.

Mr. F. M. CAIRD exhibited eight cases in which Pylorectomy had been performed for malignant disease and in which the patients survived in perfect health. He also showed a woman, aged 27 years, who had made a good recovery after an operation for Acute Pancreatitis. She had been seized with acute epigastric pain, vomiting, and catchy respiration. The pupils were remarkably contracted and a diagnosis of acute pancreatitis was made. On opening the abdomen bloody serum exuded and on the surface of the omentum white spots of fat necrosis were observed. On the pancreas two large necrotic areas were observed; these were scraped and drained. The gall-bladder was greatly enlarged and was stitched to the abdominal wound. When it was opened much dark bile and numerous gall-stones escaped.

Dr. R. W. PHILIP showed several patients illustrative of the Cutaneous and Ophthalmic Tuberculin Reaction. He said that in suspicious and not easily recognised cases of tuberculosis this reaction might be useful. For some years past he had employed the subcutaneous injection of tuberculin as a diagnostic aid and stated that it was accompanied by no serious risk. It had been condemned, however, as likely to induce an acute exacerbation in latent tuberculous conditions. He showed cases in illustration of the cutaneous method. The skin of the arm was scarified in the ordinary manner and a solution of tuberculin was rubbed in. This solution contained 25 per cent. solution of old tuberculin, 25 per cent. solution of carbolic acid in glycerine, and 50 per cent. of normal saline solution. In the course of from 24 to 48 hours a definite local reaction in the form of a rosy red patch was seen, the skin became infiltrated, and papules or vesicles formed. A scaly condition of the skin followed and the redness faded, but for some weeks subsequently a certain degree of pigmentation remained. The ophthalmic reaction was obtained by dropping one minim of the following solution between the eyelids. In from three to six hours later a perfect reaction was obtained and left no permanent change. The solution consisted of five milligrammes of dry tuberculin (precipitated by alcohol) in ten minims of sterile normal saline solution. A congestion appeared on the palpebral and ocular conjunctiva, especially towards the inner canthus. The caruncle became inflamed and a certain amount of exudate might form. The reaction seldom persisted for more than a week. It had to be borne in mind that the reaction might not occur even in cases in which tubercle bacilli might be abundantly observed.

Mr. H. ALEXIS THOMSON showed a patient, aged 29 years, who had sustained a Gunshot Injury of the Upper Arm six months before he came under observation, with smashing of the humerus and tearing of the musculo-spiral nerve. An operation was performed for ununited fracture of the humerus, when it was found that the extent of destruction of the nerve rendered suture impossible. The distal end was therefore inserted into the median nerve above the elbow.

Mr. J. W. B. HODSDON showed a case of Dupuytren's Contraction which had persisted for 20 years and was cured by hypodermic injections of "fibrolysin." Two cubic centimetres of the solution had been injected on 19 occasions, either intravenously or subcutaneously, and not necessarily near the affected part. Fibrolysin caused a softening of pathological fibrous tissue, but as it did not cause its absorption this had to be facilitated by massage, &c. This treatment was useful in all cases of fibrous adhesions, scars, adhesions of the pelvic organs, corneal opacities, &c.

Mr. E. W. SCOTT CARMICHAEL showed a boy, aged ten years, after Acute Suppurative Cholangitis and Cholecystitis following generalised streptococcal peritonitis.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Exhibition of Specimens.—The Teaching of Obstetrics.

A MEETING of this section was held on Dec. 13th, 1907, Mr. E. H. TWEEDY, the President, being in the chair.

Dr. HENRY JELLETT exhibited a Uterus showing unusual thinning of the muscle of the fundus after pregnancy obtained from a patient who was 30 years old and was suffering from carcinoma of the vagina. She had had a baby four weeks before going into hospital. He decided to perform an operation but during the night before it was to take place her temperature rose to 104° F. and she had severe rigors. On the morning of the day of the operation her temperature was still 104° and her pulse-rate anything up to 140. The operation was therefore contra-indicated and so he thought it best to wash out the uterus. Before doing so he inserted a sound and this passed into the abdominal cavity straight through the fundus the resistance of which was quite inappreciable. He did not like to leave a probably septic uterus with an opening into the peritoneum and so he removed the uterus by the vagina and as much of the cancerous vaginal wall as he could. After the operation he split the uterus to see why the sound had gone through it and he found that there was a cone-shaped excavation extending through the fundus almost up to the peritoneum. The rest of the wall preserved its normal thickness. Microscopical examination of the fundus showed no evidence of malignant growth. The only explanation that he could offer as to the cause of the perforation was that the placenta had exercised an eroding influence on the uterus at one spot. The patient got better for a time but died about two months afterwards from general metastases and weakness.

The PRESIDENT exhibited a Double Pyosalpinx removed intact. He said that the patient complained only of sterility. She had no pain and she did not look ill. She was young, two or three years married, and had been sent to him to be curetted. He palpated the tumours and diagnosed double ovarian cyst; the uterus was felt lying between them. He was very much surprised to find that they were really very large tubes. They were taken out and joined together without difficulty. The point of interest was that he hoped he had thus cured the patient's sterility. There was one ovarian cyst which was removed. The other ovary was resected and a good sound piece left behind together with healthy tube stumps.

Sir WILLIAM J. SMYLY opened a discussion on the Changes which had been suggested by the General Medical Council in the method of Teaching Practical Obstetrics. He said that the circumstances which had led up to the action of the General Medical Council originated in the discovery of the true nature of puerperal fever by Semmelweis and its prevention by Lord Lister, in consequence of which this scourge had been practically banished from our lying-in hospitals. The hope that a similar result would follow in general practice had not been realised, and Dr. R. Boxall had shown that from the returns of the Registrar-General it appeared that the maternal mortality from septic infections in childbed was even worse than it had been. The publication of these facts produced a profound impression in England, the outcome of which had been the Midwives Act and the efforts

on the part of the General Medical Council to improve the education of students in midwifery. In England the opportunities for the teaching of practical midwifery were meagre so that it was necessary to make very moderate demands upon students with regard to the practical study of midwifery, but in Ireland, with its great lying-in hospitals, it would be a retrogression to adopt any of the recommendations of the General Medical Council. Dr. Boxall had shown that the statistics of obstetrics in general practice were worse in Ireland than in England. In order to remedy this students must either be compelled to attend a certain number of confinements or demonstrations, or, what would be much better, a desire to study practical obstetrics must be aroused in them by adopting the recommendation of the General Medical Council with regard to practical clinical examination. They should be made to feel that a practical knowledge of obstetrics and gynæcology was useful in passing examinations.—Mr. A. J. HORNE said that the subject was of particular interest to Dublin, which was practically the home of obstetrics. The Dublin school for a great number of years had rightly insisted that the course of study should be a comparatively long one, and the General Medical Council, in order to raise the standard of both England and Scotland, had offered to compromise with Dublin by suggesting that the period of study should be three months. Annually in Dublin something like 200 students had to take out their course of midwifery. If they simply attended for three months it would be utterly impossible to supply them with material for each man to take out his 20 "conductions." The period was too short. How it would be accomplished in England he did not know, but he did not believe that the keeping up of the existing Dublin standard would cause a single pupil to leave the country.—Dr. FREDERIC W. KIDD said that midwifery was a subject in which it was very necessary to have a thorough knowledge of the theory before practical work was attempted. It was an established fact that the mortality in the lying-in hospitals was lower than that of general practice in the country, notwithstanding that the dangers to a woman in a hospital were greater than those in private practice and the cases were more morbid and serious. The unavoidable inference was that the medical practitioners and nurses did not carry out in general practice the same strict rules of asepsis as in the institutions where they were taught to do so. He felt that a man who lived in the precincts of a hospital for one month would in all probability lay up a greater store of knowledge than one who attended a lying-in hospital two days in the week for three months.—Dr. RICHARD D. PUREFOY suggested that some arrangement might be made with the masters of the hospitals by which the obstetrical examiners of the colleges might make a monthly visit and have opportunity given to examine certain students. This would obviate the difficulty of carrying out the practical examination for a large number of students at one time. He thought that students should be encouraged to reside, even for one month, in some of the maternity hospitals.—Dr. JELLETT said that they were all probably agreed that the recommendations of the General Medical Council were extremely good, with the exception of the alteration in the course of attendance at maternity hospitals from six to three months. In Ireland such an alteration would shorten the present course, whereas in England and Scotland it would raise it to a much higher standard than before. He was quite aware that the present state of affairs was open to the objection that all students did not attend the full course. A three months' course presented the great practical difficulty that students could not be given their 20 cases in so short a time. He thought that if the Dublin Colleges adhered to their six months' course and made some attempt to define regular attendance they would not only maintain but enhance the reputation of the Dublin School and would make the obstetrical training of the greatest value to the student.—Dr. ROBERT J. ROWLETTE said that there were certain faults in the final examinations in midwifery and gynæcology and that if these were taken away the subjects would be more attractive to students: one was the excessive amount of surgery required by the gynæcological examiner; it was no part of the duty of an ordinary medical practitioner to be able to perform highly technical operations. If the student was going to be a specialist he must make up his work after his qualifying examination, not before it. He was only referring to highly technical operations; operations of emergency must, of course, be within the knowledge of every medical man. As to the high mortality in private practice he thought it might be explained by the fact that more cases of childbirth were left unattended by medical men in Ireland than in England. It was also quite impossible for a medical man to practise the same aseptic precautions in a country cottage as in a hospital.—The PRESIDENT said that it was pleasant to see with what unanimity the members of the Obstetrical Section opposed the suggested curtailment of the period at present deemed necessary in Dublin for attendance at maternity hospitals.—It was then proposed by Sir WILLIAM SMYLY, seconded by Dr. JELLETT, and carried unanimously:—

That the Obstetrical Section of the Academy of Medicine regards the recommendations of the General Medical Council regarding obstetrical teaching as in many cases a very great advance on the present conditions. The section, however, considers that the suggested alteration of the period of attendance on a maternity hospital from six months would not be advisable or practicable. The section considers that instead of reducing the attendance the licensing bodies should adopt such regulations as will insure regular attendance of students at the clinical teaching of the hospitals. With regard to the adoption of a practical examination in midwifery and gynæcology, the section considers that such a step is most desirable and urges its members to aid it by all means in their power.

Dr. PUREFOY then proposed, Dr. KIDD seconded, and it was carried unanimously:—

That a committee consisting of the masters and assistants (past and present) of the Dublin maternity hospitals be appointed for the purpose of urging upon the licensing bodies the inadvisability of changing the course of practical obstetrics from six months to three months.

WINDSOR AND DISTRICT MEDICAL SOCIETY.—A meeting of this society was held at the Guildhall, Windsor, on Dec. 18th, 1907, Dr. E. S. Norris (Eton), Vice-President, being in the chair.—Dr. W. H. W. Attlee read a paper entitled, "The Treatment of Puerperal Eclampsia." He commenced by recounting the theories advanced to explain the phenomena of eclampsia, the microbic, the placental, that of thyroid inadequacy, and the auto-intoxication theory, pointing out that the last was the one which found most favour at the present day, the toxin being supposed to be formed in some way in the intestinal tract and absorbed from there into the general circulation. This was borne out by post-mortem appearances, for the cell necrosis so evident in the abdominal viscera was most noticeable in the liver, which was what would be expected if the portal vein were collecting the poison from its tributaries. Dr. Attlee proceeded to divide the treatment into two stages: (1) that before the convulsions had occurred; and (2) the actual attack of eclampsia—i.e., when the convulsions had begun. In the first stage he advised the postponement of active measures as long as possible, treating the patient with rest in bed, absolute quiet, free purgation with calomel or diuretic salts, and a milk diet. If in spite of this matters grew worse labour would have to be induced. In this connexion Dr. Attlee emphasised the importance of examining the urine of every pregnant woman and related a case illustrating the benefit derived from such routine examination. When the fits had already begun the first duty was to attend to the convulsions. The patient should be prevented from injuring herself and the tongue should be protected. One minim of croton oil or five grains of calomel or even salts if possible should be administered at once. Chloroform should be used to control the paroxysms, and when the patient was well under its influence an examination should be made and a decision arrived at as to whether labour should be terminated or not. With regard to this important point Dr. Attlee said that probably the indications for induction of labour were similar to those which would point to a grave prognosis—viz., fast and feeble pulse, scanty urine, rising temperature, and a prolonged duration of coma between the fits. The scantiness of the urine was more important than the amount of albumin. After describing the best means of inducing labour Dr. Attlee detailed the treatment to be adopted if it should be decided not to terminate the labour. In this event he said that morphine should be given, best hypodermically in doses of one-third of a grain every two hours until a grain had been given. Saline solution should also be infused both into the subcutaneous tissues and into the rectum. The administration of thyroid extract was discussed. Should the eclampsia occur actually during labour Dr. Attlee advised that the labour should be terminated as quickly as possible, great care being taken to avoid sepsis, the danger of this complication in such cases being duly insisted on. Allusion was made to the

post-partum variety of eclampsia, and here again it was said that the drug indicated was morphine. Finally, Dr. Attlee read notes of a most unusual case, fortunately with a favourable termination, in which the puerperium was complicated by symptoms of the gravest augury—viz., jaundice, suppression of urine, twitching of the limbs, drowsiness, and coma. There were diminution of the area of liver dulness and tenderness over the right hypochondrium, the temperature and pulse being only very slightly raised. The rapidity with which these symptoms disappeared suggested some form of toxæmia as the cause, but whether this was of the nature of eclampsia, icterus gravis, or sapræmia he was unable to determine.—A brief discussion ensued in which Dr. Norris, Dr. W. F. Lloyd, Mr. J. W. Gooch, Dr. A. M. Amsler, Mr. A. D. Crofts, and Dr. C. R. Elgood took part.

Reviews and Notices of Books.

Surgery, its Principles and Practice. By Various Authors. Edited by WILLIAM WILLIAMS KEEN, M.D., LL.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Vol. I., pp. 983. With 261 text illustrations and 17 coloured plates. London and Philadelphia: W. B. Saunders Company. 1906. Price 30*s.*

Professor Keen has secured the assistance of 66 able colleagues in the arduous work of compiling a system of surgery. It is to extend to five volumes and will contain more than 4000 pages, and the names of the writers are in themselves a guarantee that this treatise will contain a full exposition of modern surgery. No one could be better fitted for the task of editing such a work as this than Professor Keen and a careful perusal of this volume serves but to confirm our anticipations. Dr. Mumford of Boston has contributed a sketch of the History of Surgery and though by no means exhaustive it is sufficiently full for a text-book. Unfortunately, few surgeons seem to care about the history of their craft. It has often been suggested that the history of medicine should be a subject for examination; this is not desirable, as the curriculum is quite extensive enough at present; but at most medical schools a few lectures each year on the history of the medical sciences would, we are sure, be well attended and very popular. The University of London might well consider the question of instituting some such lectures. Dr. G. W. Crile of Cleveland has contributed a chapter on Surgical Physiology. It deals chiefly with the changes of blood pressure in injuries and operations. It is of very definite interest and importance. The article on the Examination of Blood by Dr. J. C. Da Costa, jun., is moderate in tone and does not claim for examinations of blood that finality in doubtful cases which some of the advocates of hæmatology demand for it. In many difficult cases the surgeon needs all the aid that can be obtained and examination of the blood may assist in deciding on a diagnosis, but like most other signs and symptoms it must not be given pathognomonic value. Dr. Ludvig Hektoen of Chicago has written a useful chapter on Infection and Immunity and he has explained fully the various current theories of the latter condition.

The chapter on Inflammation has been contributed by Dr. J. G. Adami of Montreal and it is hardly necessary to say that the account is thoroughly good. The part of the article dealing with the treatment of inflammation has to do only with the broad questions of treatment, the details of the treatment of special inflammations being dealt with elsewhere. Dr. G. E. Armstrong has assisted Dr. Adami in some of the practical details and the result is excellent; it is a happy combination of theory and practical knowledge. The treatment advised must depend, to a large extent, on our present knowledge of inflammation, but recognising, as we all must, that that knowledge is not final the authors have wisely not carried the theories to extremes. They explain the arrest of erysipelas from painting the healthy skin beyond with nitrate of silver as due to a localised leucocytosis, and the frequent failures of this method of treatment are attributed to the painting having been done too near the advancing erysipelatous edge, for streptococci may be as much as half an inch in front of the visible edge of the erysipelas. In similar ways the authors explain both the successes and the failures of many of our procedures which we have employed for empirical reasons for many years.

Dr. L. Freeman of Denver is responsible for the section on Suppuration, Abscess, Ulceration, and Gangrene, and we need only say that it is very readable and up to date. Dr. F. C. Wood's account of the process of repair is provided with a good bibliography, though, as the writer remarks, it contains only the more important references. Here we may mention that all the articles conclude with a list of the more valuable writings on the subject treated. Dr. C. H. Frazier of Philadelphia has written on Thrombosis and Embolism and the succeeding articles deal mainly with specific diseases, Dr. Frazier writing on Erysipelas, Tetanus, Anthrax, Actinomycosis, and similar infections; Dr. Frazier speaks in favour of intraneural injections of antitoxin in the treatment of tetanus—a method but little used in this country.

Dr. E. A. Smith of Buffalo has contributed an excellent article on the Traumatic Fevers. He objects to the use of the term "sapræmia," chiefly apparently because it is not always possible to distinguish between cases where the products only of the micro-organism in the wound have been absorbed and those cases where the pathogenic organisms themselves have entered the blood stream. We cannot agree with him; the distinction in typical cases is clear and important and the term well deserves to be retained. The article is illustrated by some very good temperature charts. In Dr. E. H. Nichol's paper on Rickets he discusses the etiology and he mentions the deficiency of lime theory, the lactic acid theory, and the toxic theory, but he does not (so far as we have been able to see) say anything about the theory that absence of assimilable fat in the food is the cause of rickets. The chapter on Surgical Tuberculosis by Dr. J. C. Da Costa occupies over 80 pages and gives a good account of this important branch of surgery. The tuberculin treatment is mentioned and condemned but nothing is said of the use of tuberculin when controlled by opsonic estimations.

Dr. E. Martin of Philadelphia has written on Chancroid and on Syphilis. We agree with him that the chancroid is probably caused by a special micro-organism and is not merely the result of ordinary pyogenic cocci. The spirochæta pallida is described and figured. The section on parasyphilis is poor. This grouping suggested by Fournier of a large number of indefinite conditions, many of which have absolutely nothing to do with syphilis, is decidedly a retrograde step. To include in one class leucoderma, keloid, diabetes, and neurasthenia is absurd. Tabes and general paralysis of the insane stand upon quite a different footing. It is useless to finish this section by such a sentence as this: "Infantilism, hydrocephalus, hare-lip and cleft palate, club-foot, idiocy, any of the dystrophies may be parasyphilitic in nature." Mr. J. Bland-Sutton's paper on Tumours is characterised by that originality of idea and method for which he is well known. It is very complete, occupying nearly 150 pages. Dr. Crile has written on Wounds and Contusions and also on Shock. He describes the "pneumatic suit" which he invented; it consists of a double layer of rubber which is inflated with a bicycle pump. By means of this suit he can raise the blood pressure by from 15 to 40 millimetres of mercury. It is certainly ingenious and deserves to be known more widely.

The whole volume is very fully illustrated and we must

not omit to mention the extensive index which has been provided. The work is a credit to the editor, to the contributors, and to the publishers.

The Labyrinth of Animals. By ALBERT A. GRAY, M.D. Glasg., F.R.S. Edin. Vol. I. London: J. and A. Churchill. 1907. Pp. 198. Price 21*s.*

THIS volume is the first instalment of a series of stereoscopic plates illustrating the internal ear of animals, by which we presume vertebrates are meant. The author decides —and we think wisely—to work downward through the vertebrate phylum, beginning with man; consequently this first volume with its 31 plates deals with only a part of the mammalian class and includes the orders of Primates, Cheiroptera, Carnivora, Ungulata, Edentata, and the majority of the Rodentia. An examination of the plates shows that technical skill of the highest class must have been expended on the preparation of the specimens as well as in photographing them, and we are not surprised to read that the author has spent seven years in completing his series and that a large part of this time was devoted to perfecting his methods. Each plate shows the labyrinth decalcified and removed from the skull, suspended by the superior semicircular canal and looked at generally from the outer side. A small stereoscope is inclosed in a case in the cover of the book and with a very little practice a perfectly beautiful representation of the original specimens is seen magnified some five times. The method of preparation is fully detailed; roughly speaking, it consists in decalcifying and clearing but the minutiæ are complicated and each specimen takes three months before it is ready for photographing.

There is no doubt that this will prove a valuable work of reference for the comparative anatomist, the physiologist, and the aural surgeon. To the first certainly it is most valuable because up to the present so little has been known about the internal ear of mammals, although Retzius has done much for that of the lower vertebrates. Dr. Gray regards the cochlea as a useful structure to take into account in the classification of animals, because, as he says, it is not subject to marked variation as a result of particular environment. Whether an animal lives in the air, the water, in the tree tops, or underground, it must always hear and so, if its cochlea varies, it is a sign of relationship rather than excessive use or disuse. We are a little doubtful whether the material at Dr. Gray's disposal is sufficiently large to allow him, not to dogmatise—he does not attempt that—but to make even plausible suggestions. It must be remembered that, immensely valuable though his contribution to science is, it is only a contribution, and that generalisations on the bats have to be made on his two specimens, one of the fruit bat and the other of the pipistrelle, while that extremely heterogeneous order, the Edentata, is also only represented by two specimens, the three-toed sloth and the Tamanduan ant-eater. Until more material is available it would be premature to say whether the cochlea is or it not a point of classificatory value.

The author notices that cochleæ fall into two categories which he calls flat and sharp pointed and that these are not necessarily dependent on the number of turns there is in the spiral. He further points out that the different orders of mammals fall moderately satisfactorily into one or other of these categories; but here again we should like more material before expressing an opinion since both types of cochlea have been found in the marsupials, although only the kangaroo, the wallaby, and the phalanger have been examined. A very interesting point in the semicircular canals is the variable size of the perilymph space which is in most mammals small or even absent, though sometimes, as in man, larger than the endolymph space. Dr. Gray thinks that the latter is probably the more primitive or generalised condition since it also exists in reptiles and birds.

In discussing the subject of otoliths the author says that it is important not to mistake them for pathological deposits of calcareous salts which may occur in any animal and in any position in the vestibule. It is not quite clear whether these deposits are the otoconia which are well known to comparative anatomists and are so constantly found that it is doubtful whether pathological is quite the right adjective to use; indeed, there is one shark which accumulates granules of sand through an open aqueductus vestibuli and these apparently serve the same purpose as the otoconia in other forms.

At the end of the book is a table of measurements which will be undoubtedly valuable in the future when the morphologists, physiologists, and field naturalists come to tackle seriously the meaning of the variations found in the internal ear. Meanwhile, we cordially thank Dr. Gray for a valuable addition to our knowledge and look forward to the appearance of his second volume.

Atlas and Epitome of Diseases of Children. By Dr. R. HECKER and Dr. J. TRUMPP. Authorised translation from the German, edited by ISAAC A. ABT, M.D. With 48 coloured plates and 147 black-and-white illustrations. London and Philadelphia: W. B. Saunders Company. 1907. Pp. 453. Price 21*s.* net.

THE original German work, of which the present volume is the authorised English translation, was published in the year 1905. In Germany the book has proved an undoubted success owing probably to the fact that a work of this kind, attractive in appearance and profusely illustrated, presents a striking contrast to the usual ponderous and dull class of book which is published for the instruction of German students. The authors admit that no text-book can take the place of clinical observation but they believe that this failing can to a great extent be supplied by pictorial illustration of the kind to be found in their atlas and epitome. With this object in view they have arranged an enormous number of coloured and uncoloured illustrations in a series and in a manner which they believe will be useful to students who have not had the advantage of complete clinical instruction.

In the translation considerable changes have been made in the sections on therapeutics and these have been revised in accordance with accepted practice in America; additions made by the editor will be found inclosed in brackets. So far as the text is concerned there is little need for comment; it represents a highly condensed and commendably accurate summary of the common diseases and ailments to which children are subject. Therapeutics and treatment, in spite of the alterations and amendments made by the editor, are scanty and of such a superficial character that we doubt whether they will be of much use to the student or indeed to the practitioner. On the other hand, the illustrations, especially of the rashes of the specific fevers, should be extremely valuable; there seems to us, however, to be far too many illustrations of microscopic and macroscopic pathological specimens. The illustration of Hecker's urine vessel for infants which appears on p. 386 shows an infant placidly sucking an indiarubber teat. We hope that the students who read this book will not regard "the comforter" as an essential in nursery equipment.

An Index of Treatment by Various Writers. Edited by ROBERT HUTCHISON, M.D. Edin., F.R.C.P. Lond., Physician to the London Hospital, &c., and H. STANSFIELD COLLIER, F.R.C.S. Eng., Surgeon to St. Mary's Hospital, &c. Bristol: John Wright and Co. 1907. Pp. 877. Price 21*s.* net.

WHETHER it is that we are pygmies compared with our forefathers, or that collectivism is in the air, or simply that a multitude of authors provide so many separate centres of

infection, if we may so term them, for the sale of a book, certain it is that the *épaves* or contribution feast is now popular in medical literature rather than the banquet provided by the mature experience of a single author. The Index before us is the work of 72 contributors and, amid such a multitude, we cannot but admire the modesty of the surgical editor who has apparently made no contributions to the text but has contented himself with supervisory work. The book deals with medicine, surgery, and special subjects and so far as it is possible to comprise the treatment of all ailments to which flesh is heir in a single volume the result is satisfactory. The articles are clear and to the point and "care has been taken to avoid embarrassing the reader with a large choice of procedures." The book should prove useful to the practitioner in the course of his everyday work. The impossibility of separating treatment from questions of diagnosis and pathology is illustrated in this Index, and here and there the editors have been unable to refrain from sections dealing summarily with these subjects. It has also apparently been thought necessary to add an index, which is rather a confession of failure in the original arrangement. The supplementary index contains a good many examples of how not to do it. Such entries as "Incision, its use in empyema," "Danger, Condition of, in Anæsthesia," serve as examples. We may add that "Achoria" can only mean inability to dance, the treatment for which would presumably be different from that for "acoria" (*ἀκορία*), failure of the sense of satiety. The printing of the book is good, the type employed being clear though necessarily close, while misprints are rare. The illustrations are also useful and are adequate in number.

LIBRARY TABLE.

Light and X Ray Treatment of Skin Diseases. By MALCOLM A. MORRIS, F.R.C.S. Edin., Dermatologist to King Edward VII.'s Hospital for Officers, Surgeon to the Skin Department of the Seamen's Hospital, Consulting Surgeon to the Skin Department of St. Mary's Hospital; and S. ERNEST DORE, M.D. Cantab., Assistant in the Skin Department of the Middlesex Hospital. With 12 plates. London, Paris, New York, Toronto, and Melbourne: Cassell and Company, Limited. 1907. Pp. 172. Price 5*s.*—This is one of a series called "Modern Methods of Treatment" which is being issued by Messrs. Cassell and Company. In recent years many new methods of treatment have been introduced and there is a demand for more detailed accounts of them than those to be found in the ordinary text-books. Especially is there a need for a full description of radiant methods of treatment of diseases of the skin. Most medical men have very vague ideas of Finsen light and x rays and they would like to know more even if they have no intention of practising these methods. Sir Malcolm Morris and Dr. Dore are well qualified to speak with authority in these matters, as they have both had much experience in the radiant methods, and the former was one of the earliest to employ Finsen light in this country. The book is not, and is not intended to be, exhaustive but it contains all the essentials. The authors are very satisfied with the x ray treatment of ring-worm, and though they use and appreciate Sabouraud's "pastilles" to measure the intensity of the rays, yet they do not think it advisable to depend on them alone. The ampèrage of the primary current, the volume of the induced current, the spark-gap, the appearance of the tube and of the anode, and the time of exposure should all receive attention.

Le Micro-organisme de la Syphilis, Treponema Pallidum (Schaudinn). Par le Dr. LÉVY-BING, Chef de Laboratoire de Saint-Lazare, Lauréat de la Faculté de Médecine. (*The Micro organism of Syphilis.* By Dr. LÉVY-BING.) With figures in the text and one chromo-lithographic plate. Paris: Octave Doin. 1907. Pp. 329. Price 5 francs.—The microbe first described by Schaudinn is now accepted almost universally as the cause of syphilis. Many previous "discoveries" of the bacillus of syphilis have been made but time has always disproved the claims. The spirochæta pallida, as it was first called, or treponema pallidum as it is now known, is stained with a good deal of difficulty and it was not till the special stain was employed that it was possible to see it. It is now of diagnostic value, at least so far as its presence is concerned; if it is not found its absence may only be apparent and may be due to want of skill on the part of the examiner. This volume contains all that was known up to the moment of publication of the treponema pallidum. The microscopic technique is fully detailed and the natural history of the organism is discussed. Unfortunately, we cannot grow it on any of the media tried and so its life-history is as yet undetermined. An interesting chapter is that dealing with the action on the treponema of mercurial treatment. Some observers have found the organism present after some treatment but Dr. Lévy-Bing has shown that under careful mercurial treatment the treponema steadily diminishes in abundance as the treatment is continued. The book is very thorough and well deserves perusal by all interested in this subject.

Wit and Humour of the Physician. By F. R. London: Alexander Moring. 1907. Pp. 218. Price 1*s.* 6*d.*—This little book contains an abundance of medical anecdotes, quips and cranks, and if they are not all likely to be greeted by "wreathed smiles" yet there is a sufficiency of amusement in them to justify their title. The way to enjoy a book of this kind is to take it in small doses; if many pages be ingested at one gulp they are liable to cloy. We are a little tired of the many variants of the old theme which jocularly accuses the doctor of being the immediate cause of a sick man's demise or a fee-lover above other men. The book may be useful to after-dinner speakers at professional gatherings who have not the natural means of leavening their wisdom.

The Poems of Samuel Taylor Coleridge. With an introduction by A. T. QUILLER-COUCH. *The Three Clerks.* By ANTHONY TROLLOPE. With an introduction by W. TEIGNMOUTH SHORE. *The Life of John Sterling.* By THOMAS CARLYLE. With an introduction by W. HALE WHITE. *Margaret Catchpole.* By RICHARD COBBOLD, with an introduction by CLEMENT SHORTER. The World's Classics Series. London: Henry Frowde. 1907. Price 1*s.* each.—*Sesame and Lilies* and *Ethics of the Dust.* By JOHN RUSKIN. London: George Allen. 1907. Price 1*s.* net.—The World's Classics continue to stream from Mr. Frowde's press with a regularity that seems to bespeak a solid appreciation on the part of the reading public. Every batch which we receive serves to remind us of the richness of true English literature. It is not the function of a medical paper to review critically the substance of such reprints as these, and indeed in the case of many there is hardly any new thing to be said. Coleridge has certainly found his level as one on whom the fire from Heaven descended in his youth but whose flame was wofully quenched by profitless metaphysical self-torture in his riper years. But whilst poetry lives, "The Ancient Mariner" and "Kubla Khan" will retain to the full their mystic force. Two of the lesser known works of Carlyle and Trollope come next before us, the one an earnest apologia, the other a novel written only to amuse, and both with the stamp of a bygone day upon them. We take it that the introduction to "John Sterling" by W. Hale White is not written by the physician of that name but by the able author of "Mark Rutherford's Deliverance" who now employs the name of his hero as a literary pseudonym. Mr. Teignmouth Shore's introduction to "The Three Clerks" is delightful. The remaining novel

of Mr. Frowde's batch is a well-known Suffolk story of the barbarous penal code which prevailed in the eighteenth century. The last book of which we write, though of almost similar *format*, is from Mr. Allen's press at the house which bears the name of the author of "Sesame and Lilies" and "Ethics of the Dust." In spite of Ruskin's well-known desire that his books should be sold at "an entirely just price," which meant more than the members of the working classes were usually prepared to give to obtain them, yet we welcome the wider dissemination of his teaching by the lowering of its market value. No author could surely wish to put a bound to the knowledge of such a notable saying as this, that a book is written because "the author has something to say which he perceives to be true and useful or helpfully beautiful. So far as he knows no one has yet said it; so far as he knows no one else can say it. He is bound to say it, clearly and melodiously if he may, clearly at all events," and so on to the rest of that noble passage. Think what we may of Ruskin's ideals and illusions, his almost painful sense of justice or his lack of balance, we must ever be grateful for such beautiful thoughts as abound in "Sesame and Lilies," "The Crown of Wild Olive," and many other of his writings. It is also a real pleasure to renew acquaintance in this volume with his charming idyll of the crystals which certainly did not receive the recognition that it deserved when first it was published. We hope to see before long all of Ruskin's works issued in series with this volume, on the production of which we congratulate his publisher.

The Maternity Nurse's Daily Guide or Pocket Book of Reference. By GERTRUDE C. MARKS, Certificated, Obstetrical Society of London. London: Baillière, Tindall, and Cox. 1907. Pp. 112. Price 1*s.* 6*d.* net.—Miss Marks describes her book as containing clear and concise directions as to the duties and responsibilities of a maternity nurse from the time of her engagement to nurse a patient until the completion of the case, and we are able fully to endorse her claim. Not only do the material duties of the maternity nurse receive clear consideration but a few sentences upon the tactful management of cases prove that Miss Marks is fully appreciative of one of the most important elements that make for success in her calling. Another praiseworthy feature of the book is that, with one exception, it draws a clear and authoritative distinction between the spheres of duty of nurse and medical man; the exception occurs on p. 32, Section 86, where the nurse is directed to remove the placenta from the uterus manually if it be not expelled within an hour. In the case of urgent post-partum hæmorrhage, such as is considered on p. 89, this might well be the right course for her to adopt but in the absence of urgency we consider that a medical man should be summoned to effect the removal, for the nurse's protection no less than the patient's. The list of "necessary articles for the mother" is a little long but certainly they are all desirable. We venture to think that this book will prove especially useful to midwives who were practising before the recent Act was passed; it is conveniently small and cheap.

Hossfeld's Polyglot Correspondent. London: Hirschfeld Brothers, Limited. 1907. Pp. 461. Price 3*s.* 6*d.* net.—The intention of this little book, which will fit into the pocket, is that "any mercantile letter may be composed in either English, French, German, or Spanish by the simple method of combining sentences selected from the pages of the work." It also contains a vocabulary of technical expressions and business words in everyday use. A book constructed on these lines is likely to be very useful to the Englishman who has to compose a letter in a hurry in any of the foreign languages mentioned and this little book should be of some assistance, but we think it needs careful revision as we have detected several errors in turning over its pages. For instance, on p. 63 we see "plustôt" for "plus tôt"; on p. 71, "Wiederholte" instead of "wiederholte"; on p. 86, "erhaltei ch" instead of "erhalte ich"; on p. 83, "Sein Sie" instead of "Seien Sie"; on p. 123, "tou" for "tous"; on p. 182, "höchsten" for "höchsten"; on p. 232, "ordrez" for "ordres"; on p. 347, "ing" or "inq" for "cinq"; on p. 359, "camphore" for "camphor"; and on the same page "capres" instead of "capers. On p. 361, "Chartreuse liquor" is not usual. On p. 436, for "bill of lading" we miss the familiar "connaissement." On p. 441, "roue dentée" is hardly "dented wheel," but should be toothed-wheel or cog-wheel; and on the same page "marchand de comestibles" is hardly "dealer in eatables," but ought to be "provision merchant" in English. On p. 442, "Down the river" is translated into French by "Amont," but "amont" means "up the river." "En aval" is the French for "down the river." On p. 446 the expression "mark of a coin" is hardly what is meant, we think. Should it not be "mint-mark"?

Hindustani Grammar Self-Taught. In four parts: 1. A. Simplified Grammar; 2. Exercises and Examination Papers; 3. The Vernacular; 4. Key and English-Hindustani Dictionary. By Captain C. A. THIMM. Second edition. Revised by SHAMS'UL 'ULAMA SAYYID 'ALI BILGRAMI, M.A. Cantab., LL.B., Assoc. R.S.M. London, M.R.A.S. London: Marlborough and Co. 1907. Pp. 120. Price, wrapper, 2*s.*; cloth, 2*s.* 6*d.*—This is an attempt to teach Hindustani by means of the Roman character and the attempt has been successful. It is not, of course, possible to transliterate exactly the Hindustani words but much has been done to facilitate the acquirement of the colloquial language. Many Europeans find great difficulty in reading the Arabic character in which Hindustani is usually written and therefore the Romanisation is useful. The Arabic character is, however, taught to some extent and reading exercises are given and there is one page in Hindustani script. A few examination papers are answered. This little book is really wonderfully complete for its size.

JOURNALS AND MAGAZINES.

Clinical Studies: A Quarterly Journal of Clinical Medicine. By BYROM BRAMWELL, M.D. Edin., F.R.C.P. Edin., F.R.S. Edin., Physician to the Edinburgh Royal Infirmary. Vol. V. With 90 illustrations. Edinburgh: R. and R. Clark, Limited. 1907. Pp. 413.—Some very interesting lectures and reports of cases are published in this volume of "Clinical Studies." A lecture on the Process of Compensation and Some of its Bearings on Prognosis and Treatment is well worth careful perusal. Dr. Bramwell points out that the completeness of compensation depends upon several factors, the most important of which are: (1) the amount of the reserve; (2) the suddenness and extent of the call: whether sufficient time is allowed for the realisation or development of the reserve is obviously a most important point; and (3) whether the demand for compensation is temporary or continuous, in other words, whether the lesion is stationary or progressive. He then proceeds to apply these statements to compensation in lesions of the brain. His remarks on compensation in valvular affections of the heart will be found most interesting and suggestive. He directs attention to the conditions that are necessary for the production and maintenance of a sufficient and satisfactory muscular hypertrophy—the muscular tissue must be sufficiently healthy to become hypertrophied. It is evident that when myocardial degeneration is present to any extent hypertrophy can never be quite satisfactory. The cardiac muscle must receive a sufficient supply of healthy blood and the waste products of its combustion must be sufficiently quickly removed. Finally, the trophic nerve apparatus must be in a healthy condition. There

various points have an important bearing when prognosis has to be considered. A clinical lecture on the prevention of Pulmonary Tuberculosis will also be found interesting. In speaking of the infectivity of the disease Dr. Bramwell is careful to emphasise the fact that all cases of "phthisis" are not infective. In order that danger of infection may arise tubercle bacilli must be found in the sputum. Dr. Bramwell supports the imposition of compulsory notification of tuberculosis and details the measures which he considers necessary for the prevention of the spread of infection. We cannot altogether agree with the elaborate machinery which he wishes to set in motion to complete the logical sequence of compulsory notification but we do thoroughly endorse his wishes that each medical practitioner "should become a missionary for the diffusion of knowledge regarding the nature of phthisis and the means by which it should be prevented."

Caledonian Medical Journal.—The first article in the January number of the *Caledonian Medical Journal* is by Dr. W. A. Mackintosh of Stirling, being a continuation of his account of an ancient Gaelic medical manuscript. Colonel Kenneth Macleod, I.M.S., writes on Medical Education in India. A description of a journey from London to Gibraltar on the P. and O. steamer *Rome* suggests the reflection that it deserves to be read by those who are familar with Henry Fielding's "Voyage to Lisbon." Fielding went to Lisbon in 1754; the route of the two vessels was, or at least might have been, exactly the same, for part of Lisbon was faintly discernible from the *Rome*, and yet how different were the conditions of travel in the two cases. A reference to the recent Pan-Celtic Congress held in Edinburgh contains the surprising information that in Morocco there are Celtic tribes who live a clan life, play on bagpipes, speak a language intelligible to Scotch Highlanders, and use the names of M'Tir and M'Tuga, which are said to be practically the same as those of MacTier and MacDougall.

New Inventions.

THE "KENT" CHAIR.

THE Equipoise Company, of Ashford, Kent, have recently brought to my notice an ingenious form of chair which they have termed the "Kent" chair. This chair is manufactured under their patents and is arranged so that the patient can instantly be placed in any position for examination. This chair would be particularly suitable for the examination of school children under the new Act, or could be used as a

consulting-room couch. In its ordinary position it is a comfortable easy-chair. With practically no effort the back can be depressed to any angle desired and when horizontal, with the foot-rest raised, it becomes a couch, and when not in use it folds into a small compass. The chair is constructed of polished wood and upholstered in railway carriage velvet and sold at 1½ guineas.

Ashford, Kent. D. L. HAMILTON, F.R.C.S. Edin.

BRITISH MEDICAL BENEVOLENT FUND.

AT the December meeting of the committee 22 applications for assistance were received and grants amounting to £177 were voted in relief, four cases being passed over and one postponed for further inquiries. Appended is an abstract of the cases which were helped:—

Widow, aged 56 years, of F.R.C.S. Eng. Has been a confirmed invalid for the last two years. Only income a small pension which is quite insufficient for the bare necessities of life. Voted £5.

Daughter, aged 62 years, of late M.D. Earnings very small and decreasing. Has recently been defrauded of a few pounds which she had saved. Voted £5.

M.R.C.S., L.S.A., aged 62 years, who used to practise in London but whose receipts greatly decreased owing to changes in the neighbourhood and competition. For some years past has endeavoured to support himself as a locum-tenent but finds increasing difficulty in obtaining work. Wife receives boarders; children unable to help. Voted £10.

Widow, aged 60 years, of M.R.C.S., L.S.A., who practised in Lincolnshire and whose estate yielded barely 5s. in the £. Only certain income £12 10s. a year; children at present unable to help. Voted £8.

M.R.C.S., L.S.A., aged 64 years, who has been quite incapacitated for the last three months. Wife's income £23 a year; children only able to give occasional and very slight help. Relieved twice, £20. Voted £10.

Daughter, aged 60 years, of late M.D. Edin. No income, and unable to earn for herself because an invalid sister requires constant attention. Relieved twice, £24. Voted £12.

M.R.C.S., aged 53 years, who for more than a year has been totally incapacitated. No income. No children; wife takes paying guests but at present has none. Relieved once, £15. Voted £15.

Widow, aged 59 years, of L.R.C.P., L.R.C.S. Edin. No income. Earns about 2s. 6d. a week by needlework. Only child barely self-supporting. Relieved nine times, £93. Voted £12.

Daughter, aged 57 years, of late M.R.C.S., L.S.A. Income £16 a year. Health will not permit of continuous work. Relieved once, £8. Voted £6.

Daughter, aged 61 years, of late M.D. Edin. Has just lost a situation through the death of her employer. Is allowed £6 a year by a charitable society. Eyesight very defective. Relieved three times, £36. Voted £12.

Daughter, aged 63 years, of late L.S.A. No income. Used to be a governess, but has had bad health for years. A small weekly allowance from a sister-in-law but insufficient for board and lodging. Relieved six times, £62. Voted £6.

Widow, aged 69 years, of M.R.C.S., L.R.C.P. Endeavours to support herself by taking boarders or resident patients. Slight, irregular help from children. Relieved 15 times, £156. Voted £12.

Widow, aged 58 years, of M.R.C.S. Quite unprovided for at husband's death. Receives 2s. a week from relations. Relieved four times, £46. Voted £12.

Widow, aged 41 years, of L.S.A. Acts as lady-help, but salary insufficient for maintenance of her boy and her own unavoidable expenses. Relieved twice, £24. Voted £12.

M.R.C.S., L.S.A., aged 68 years, who is quite incapacitated by hemiplegia. Only income a pension from the Kent Medical Benevolent Fund. No children. Relieved twice. £24. Voted £6.

Widow, aged 62 years, of L.R.C.P. Edin. Is the owner of a small house but rent barely covers the necessary repairs and the lease expires in a few years. No children. Relieved eight times, £90. Voted £12.

Widow, aged 65 years, of M.D. Edin. Unprovided for at husband's death, and for several years acted as matron to a large institution. Is now dependent on a married daughter who can ill afford to assist. Relieved six times, £62. Voted £12.

RUGBY SCHOOL.—The governing body of Rugby School has transferred Dr. Clement Dukes to a new post created for him of consulting physician to the school, with a salary, in consideration of the long series of years during which he has acted as medical officer. The change will take effect after July next.

PULMONARY TUBERCULOSIS IN LEICESTER.—During the year 1906 213 cases of pulmonary tuberculosis were voluntarily notified by medical men to the medical officer of health of the borough of Leicester. According to a report issued by the sanitary committee of the Leicester town council an increasing proportion of persons suffering from consumption apply to be admitted for treatment at the isolation hospital and many of these cases have not been previously notified. During 1906 the total number of applications for admission was 197 but unfortunately most of the sufferers had allowed the disease to progress too far before making their application, consequently their chances of recovery had become very remote. The total number received into the hospital for treatment was 82 and even of these only a small proportion could be described as being in the early stages. The committee point out that it cannot be too widely known that it is of the utmost importance that the sanatorium treatment should be begun at the earliest possible stage of the disease. At the present time too many of the cases admitted, although greatly benefited for the time being, leave the hospital only to relapse sooner or later.

THE LANCET.

LONDON: SATURDAY, JANUARY 11, 1908.

The Treatment of Trypanosomiasis.

THE researches which have been carried out in recent years with the object of discovering an effective treatment for sleeping sickness and other forms of trypanosomiasis are of great importance to both human and veterinary medicine, since this group of diseases is responsible for an enormous loss of life, both human and animal, in Africa and other tropical regions. Until 1904, when EHRLICH and SHIGA recorded their results with trypan-red, a new dye discovered by the former, the only drug which was known to be of any value in these diseases was arsenic, the beneficial effect of which was first observed in the tsetse fly disease by the explorer LIVINGSTONE. The value of this drug was confirmed by H. W. THOMAS and by LAVERAN in 1902, and before that time LINGARD and BRUCE had employed it, but its toxicity when given in effective doses and the liability to produce sloughing at the site of injection were found by LAVERAN and MESNIL to militate against its use in the form of sodium arseniate or any of the ordinary preparations. Various attempts have been made to obtain effective non-toxic preparations of arsenic and the most successful so far has been that of W. LANDSBERGER of Charlottenburg who, in 1901, obtained atoxyl. This substance was at first regarded as the anilid of meta-arsenious acid but was shown by EHRLICH and BERTHEIM to be the sodium salt of para-amido-phenyl-arsenic acid. At the outset it must be stated that atoxyl is not non-toxic but that it is less liable to produce sloughing when injected or to give rise to toxic symptoms than the ordinary preparations of arsenic and can therefore be given in larger doses. It is stated that its toxicity is only one-thirtieth of that of other preparations. It was first employed therapeutically by BLUMENTHAL in 1902, who reported favourably upon its use, but it achieved but little notice until THOMAS and subsequently THOMAS and BREINL administered it in cases of trypanosomiasis in 1905. Since that time it has been extensively given in various forms of disease due to trypanosomes in man and animals, such as sleeping sickness, nagana and surra, with, at any rate, temporary benefit. Its actual value as a curative agent cannot be said as yet to be determined definitely and there is some diversity of opinion in this respect in regard to the cases already published, but there is a general agreement that it causes at any rate at first a disappearance of trypanosomes from the blood of infected animals with remarkable rapidity, a single dose often clearing the blood within from eight to ten hours. Unfortunately, they usually reappear after a longer or shorter interval but can be again removed by atoxyl again to reappear. As many as seven reappearances have been observed in rats with trypanosomiasis treated with atoxyl by Mr. H. G. PLIMMER and Dr. J. D. THOMSON. In most cases the trypanosomes sooner or later acquire a resistance to the action of atoxyl and they are then able to develop unchecked, eventually causing the death of the infected animal. This condition of resistance to the action of atoxyl is called by EHRLICH "atoxyl-fest." Unfortunately, it appears that such a resistant or atoxyl-fest trypanosome can infect another animal, producing the disease in a form which also resists the action of atoxyl; in other words, the condition of resistance once acquired is transmitted. In view of these facts, which have been elicited from a study of various forms of trypanosomiasis in animals, many of which are of rapid course, it is not surprising to find that in the human disease of sleeping sickness with its much more protracted course no very conclusive results have yet been obtained. The use of atoxyl in such cases with due caution and care in its administration is now recommended by most authors, and it has been employed by TODD, AYRES KOPKE, BRODEN and RODHAIN, VAN CAMPENHOUT, THIROUX and D'ANFREVILLE, BURNET and KOCH. It has, however, been pointed out that not only is its action not permanent but that in the production of an "atoxyl-fest" strain of trypanosome as a result of treatment there is a possible danger of producing an even more resistant form of the disease should infection occur in other subjects with such an organism. Other substances used for treatment have proved less satisfactory than atoxyl. Of these the most important is EHRLICH'S trypan-red which has marked trypanocidal properties. It is not, however, a very safe drug, its injection even intramuscularly is likely to lead to sloughing and it has a tendency to cause nephritis. The partial failure of atoxyl led to the trial with it, or alternately with it, of other trypanocidal substances, notably trypan-red, but although some observers have recorded improved results the combination has been generally found to be of no greater value than atoxyl alone.

One of the most important contributions to the subject recently is the paper by MOORE, NIERENSTEIN, and TODD.[1] These observers offered the ingenious suggestion that the use of atoxyl might lead to the development of a stage in the life-history of the trypanosome which, though resistant to atoxyl, might be vulnerable to other substances not noxious to the ordinary form. They therefore investigated the use of various substances, especially salts of the heavy metals, in conjunction with, or alternately with, atoxyl. With perchloride of mercury they obtained some strikingly encouraging results. In an experimental injection with trypanosoma Brucei, the infective agent in nagana, the tsetse fly disease, they found that 68 per cent. of the animals treated with atoxyl and perchloride of mercury survived, while of those treated with atoxyl only none survived, all dying eventually from trypanosomiasis although surviving longer than untreated animals. They insist that atoxyl should be given as soon after infection as possible and that fresh solutions only must be used. It should be followed by the administration of perchloride of mercury, full therapeutic doses of both drugs being given. An interesting research on similar lines was carried out under the direction of the Tropical Diseases Committee of the Royal Society by Mr. PLIMMER and Dr. THOMSON. Their results were read before the Royal Society on July 20th, 1907.

[1] Biochemical Journal, vol. ii., Pt. 5 and 6, p. 300, 1907.

The trypanosomes investigated by them were trypanosoma Brucei, the parasite of nagana, which was fatal to rats in an average time of 5·5 days, and trypanosoma Evansi, the parasite of surra, which proved fatal to rats in 6·9 days. They found that trypan-red lengthened the duration of both diseases in the rat to 14 days but in all cases living trypanosomes were found post mortem. Arsenious acid likewise lengthened the course of the disease without curing it and had the disadvantage of producing sores or sloughing at the sites of injection, even when over-neutralised with carbonate of sodium. After various trials with other bodies, including monophenyl-arsenic acid, nitrophenyl-arsenic acid, and paratolyl-arsenic acid, they concluded that there is no substance known which will by itself cause a permanent disappearance of trypanosomes from an infected animal and they proceeded to employ treatment with two or more drugs. Among the substances they used in conjunction with atoxyl were the lactate, succinimide, and sozoiodol of mercury. Of these, the combination which gave the best results was atoxyl and succinimide of mercury, by means of which a number of rats infected with nagana and surra were apparently cured, being alive and without trypanosomes months after infection. They advise that two or three doses of atoxyl should be given and that a dose of succinimide of mercury should be given at the same time as the second and third, with perhaps a third dose alone afterwards. The results with atoxyl and sozoiodol of mercury were less satisfactory and the latter drug has the disadvantage of giving a dense precipitate with a solution of atoxyl, so that the two drugs cannot be given together. Lactate of mercury has a similar property and is, moreover, very irritating to the tissues. A trial was also made with atoxyl and iodipin, a combination which gave encouraging results.

A valuable critical investigation of the action of atoxyl in the treatment of dourine or *mal de coit* due to the trypanosoma equiperdum by Professor UHLENHUTH, Dr. HÜBENER, and Dr. WOITHE has been published in Germany[2] under the auspices of the Imperial Board of Health. They arrive at results in the main similar to those of the English observers to which we have already referred. They sum up their opinion in regard to atoxyl by recommending that it should be given as early as possible and in as large doses as possible. They investigated the effect of that drug among many others upon experimental infections of dourine in horses, dogs, rabbits, rats, and mice, and obtained distinctly good results. They also mention with approval the method of MOORE, NIERENSTEIN, and TODD of following the atoxyl with perchloride of mercury. Their paper is well illustrated and contains a useful bibliography. The outcome of these various experiments by different investigators seems to hold out distinct hopes that an effective treatment for trypanosomiasis is within reach; but it should be remembered that the work is of very recent date and sleeping sickness and some other forms of this type of infection are of such slow and protracted course that the matter must still be left *sub judice* until more extended trials have been made and longer periods have elapsed after treatment than is the case at present.

[2] Arbeiten aus dem Kaiserlichen Gesundheitsamte, Band XXVII., Heft 2, 1907.

Infantile Mortality and Schools for Mothers.

HOWEVER much or however little statistics in general may appeal to the minds of thinking people, there can be no doubt that the statistics of infantile mortality and of our declining birth-rate have brought home to the public conscience the urgency in these respects of our national position. Moreover, the pressing necessity for setting our house in order which is involved in these two considerations has stimulated our inventive powers and produced a number of suggestions for mitigating the evils. In evidence of this national awakening to the grim realities of the situation a number of schemes for grappling with this appalling waste of human life has sprung up in all directions. Municipal authorities, public health departments, public charities, and private individuals are now vying with one another to find some simple and practical solution of this grave problem. Parliament has certainly contributed to the success of these schemes by passing an Act for the early notification of births, though the claims of medical men in respect of the new legislation have received no recognition; prospects of still greater benefits are held out in the Bill which is contemplated for controlling milk-supplies. Experience has abundantly proved that municipal or private effort to ameliorate the conditions under which infants are reared in the poorer class of homes is seriously handicapped for want of a pure milk-supply and for want of information of the birth of infants until it is almost too late to render them material assistance. In these two respects the ground is becoming cleared, but no one can fail to regret that medical coöperation should not have been secured on fair terms. Once again our professional altruism is to be relied on.

Although it is still too early to judge of the respective merits of the many schemes, municipal or otherwise, which are on foot for dealing with the problems of infant mortality, it may nevertheless be interesting to compare and to contrast some of the methods by which different organisations are striving to arrive at similar goals. We have from time to time published in THE LANCET reports of the working of municipal milk depôts, of the operations of public health departments, and of combined enterprises, such as those which have been successfully carried on in Huddersfield, St. Marylebone, and Finsbury, and we have now before us a little work, entitled "Schools for Mothers,"[1] which supplies an interesting account of one of the most recent experiments of this kind which for the last few months has been on trial in the metropolitan borough of St. Pancras. This new scheme combines certain of the features which have contributed to the success of some of the older ventures, such as those in Huddersfield and St. Marylebone in this country and that in Ghent in Belgium. That is to say, it aims at instructing the mother in the home by personal visitation and by demonstration in the school, while the infant is supervised medically in a special department for "infant consultations." In pursuance of the policy of the medical officer of health a great effort is made to encourage breast feeding among those attending at

[1] Schools for Mothers. London: Horace Marshall and Sons. Price 1s.

the St. Pancras school, and to further this end free dinners, or at least dinners under cost price, are provided for nursing mothers. These dinners form part of a purely voluntary and charitable enterprise; they have no socialistic significance and are only supplied to genuinely necessitous cases. The whole scheme, however, has the support and goodwill of the municipal authorities and, like the organisations of Huddersfield and St. Marylebone, it should fulfil the conditions so admirably postulated by Mrs. SIDNEY WEBB as essential for all enterprises of this kind. It represents "voluntary work in a municipal setting." The St. Marylebone scheme is perhaps as good an example of such combined municipal and voluntary work as can be found in the metropolitan area. The medical officer of health, with all the machinery of his department and with two paid female inspectors, works hand in hand with a voluntary health society which includes among its members representatives of the Poor-law administration, of the Charity Organisation Society, of the local medical charities, and of church institutions; the services are also requisitioned of a large staff of efficient health visitors. With the putting into force at the commencement of this year of the Act for the early notification of births the public health department will be informed of the births occurring in the borough, so that all infants who belong to the class for whom the scheme provides can be visited within a few days of birth by one of the sanitary inspectors or by a well-qualified health visitor. Such infants are then kept under supervision and if the need of additional help of a medical character should arise the case can be referred to the "infant consultations" at the St. Marylebone General Dispensary. These "infant consultations," which were the first to be established in this country and which had their origin in France in the late Professor BUDIN'S admirable work, are excellently equipped and undertake the hygienic and medical supervision of infants during the first year of life.

The whole problem of infant mortality is, as it were, hedged in by a closed ring of defences constituting a vicious cycle of contributory factors which act and react upon one another, and these must be attacked independently and individually if any impression is to be made on the citadel itself. Ignorance and indifference on the part of the parents, hereditary and constitutional disabilities latent in the infant, unsatisfactory housing and hygienic conditions, and often a debased moral environment are all important and essential elements in the general *ensemble* of factors which determine the high mortality among infants belonging to the poor classes. Some of the early engagements which distinguished the opening of the campaign against this unnecessary evil showed a lamentable want of appreciation of the strength of the enemy and displayed regrettable ignorance of the sociological intricacies of the problem. For instance, many believed that infant milk depôts, municipal or otherwise, were the key to the situation. The good that may be done and the harm that may be prevented by such depôts are both immense, but the insufficiency of these expedients in certain directions is apparent to all. Milk depôts or the free feeding of infants do not dissipate parental ignorance, nor do they inculcate those elements of self-reliance, resource, and moral character on which the conduct of the home and consequently the rearing of children so closely depend. The logical corollary to State or municipal feeding of infants is a similar form of feeding for older children, and if of children why not of the mother who brings the child into the world? Milk depôts do not, in fact, touch the heart of the question; they do not attack the enemy at a vulnerable point. We have made our mistakes and are now conducting the campaign on more promising lines. We are gradually accomplishing a general investment and making simultaneous attacks from several quarters. In our schools we are teaching the children the principles of hygiene and wholesome living; we are teaching our girls how to become good housewives and mothers. Nor do we neglect to instruct those who are already mothers; if necessary we feed the nursing woman, we even sometimes feed the expectant mother, through the instrumentality of such organisations as the St. Pancras school for mothers. This school is an excellent example of the good that such institutions may perform in teaching parents how to do their duty by the State without loss of independence. The little shilling book which lies before us is truly a sign of the times and a finger-post to guide us in the direction in which our efforts can be best expended. For this little work Sir THOMAS BARLOW has written a very telling introduction which in itself makes the book of value, while Dr. J. F. J. SYKES, the energetic medical officer of health and the moving spirit of the St. Pancras venture, describes the evolution of the new scheme. Incidentally he warns his readers of the danger of the indiscriminate distribution of literature bearing on the subject of the artificial feeding of infants, and, further, he tells us that when in St. Pancras there was an inclination to establish a milk depôt he gradually came to the conclusion that the distribution of bottled milk for infants of suckling age would be putting into concrete form the abstract teaching of leaflets on artificial feeding. Various other contributors who are interested in the St. Pancras school help to make this excellent little book not only interesting reading but also a valuable guide to those who are contemplating the establishment of similar undertakings for the improvement of the conditions in which the children of the poor are brought up.

The Hampstead General Hospital.

OUR readers have been kept aware of the facts concerning the proposed amalgamation of the Hampstead General and North-West London Hospitals and the resultant difficulty as to the staffing of the combined institutions. The points of view of the present medical staff and the council of the former hospital have been placed before them and the dispute has reached its present stage by the decision of a small majority of the Hampstead governors to effect the amalgamation under certain conditions. These are that the present members of the senior staff should be retained for a term of years and replaced by consultants as their places fall vacant; while the present junior medical officers are declared ineligible for the senior posts unless they adopt purely consultant practice, and this in spite of the fact that one of them holds the Fellowship of the English College

of Surgeons, which has, we believe, been hitherto universally accepted as a qualification for the surgical posts of general hospitals.

It will be seen that there is one body of men who are vitally interested in the settlement whose views on the matter might have received more attention, and that is the staff of the North-West London Hospital. It is true that these gentlemen are not absolutely entitled to be heard by the Council of the Hampstead Hospital on the matter, although, considering what an integral factor they form of the hospital with which the amalgamation has been arranged, we hold that it would have been a graceful act to take their opinion. We consider it fair to make public their view of the matter so far as we have learned it from various circumstances. In the first place the staff of the North-West London Hospital agree that the amalgamation of the two hospitals is in the best interests of the necessitous poor in the neighbourhood of both, and they accordingly welcome the proposal of this principle by King EDWARD'S Hospital Fund and its adoption by the subscribers of both hospitals. Here we may say at once that we are in complete concord. Whatever the Hampstead subscribers may say about a "Hampstead hospital for Hampstead people" the fact remains that, largely owing to the generosity of a few of their number, an important suburban general hospital has been erected, that a large number of its beds are empty, and that the free beds at present in use are found sufficient for the needs of "Hampstead, Highgate, Hendon, and the neighbourhood," the district which it was intended to serve. This may be largely accounted for by the fact that the out-patient department is looked on with much disfavour by local practitioners who, indeed, have never been enthusiastic about the new hospital. On the other hand, the Kentish Town district, which is much nearer to the doors of the hospital than are Highgate and Hendon, has a teeming population of very poor people who supply some 23,000 fresh attendances a year to the out-patient department of the North-West London Hospital and who badly need bed accommodation to replace that of which they have been recently deprived by the closing of the latter hospital's wards for lack of funds. Hampstead must realise that its hospital is no longer a nursling for local petting; it has outgrown its swaddling clothes and is ready to take its place in a sphere of large utility which lies before it. So far, then, we are in accordance with the King's Fund, inasmuch as its proposals affect the public service; but this is not the whole of the matter. The King's Fund has laid it down as an inalienable condition to its support of the scheme that the new staff shall be composed of consultants, subject to the reservations in favour of the present staff at Hampstead which we have mentioned above. It further suggested the condition that three of the North-West London staff should *ex-officio* become members of the combined staff; but this proposal has been rejected on the report of the committee of Hampstead subscribers appointed to consider the matter on the ground that the council must have a free hand to elect consultants to staff their hospital. The attitude of the staff of the North-West London Hospital on the matter is that they have not received equal treatment with the Hampstead staff, for the latter are to have the chance of remaining for a certain number of years and they themselves are given no guarantee of continued office. The inequality they consider to be accentuated by the fact that they are "a body of pure physicians, surgeons, and specialists, who have for many years administered a general hospital with 23,000 new out-patients annually, while the Hampstead institution has been a cottage hospital staffed by local general practitioners." This is true enough but it must be remembered that the North-West London staff are somewhat in the position of shipwrecked sailors, undoubtedly able mariners and wrecked through no fault of their own, but certainly with no such strong claim to man the vessel that rescues them as have the crew already in possession of it. This is scarcely an over-statement of the case, for although the North-West London Hospital might drift on as an out-patient department, yet the only hope of continued beds for members of its staff hails from the new building in Hampstead, and we do not think that they have an authoritative claim to these beds, though they may have a moral one.

But is it not possible that there should be room at the Hampstead General Hospital for both crews? The exact conclusions to which the North-West London staff has come are as follows: It considers that in the amalgamation of the two hospitals one of two alternative courses should be pursued: (1) that all members of the present staffs should become members of the staff of the new institution; or (2) that all members of the present staffs should retire from office and the vacancies so created be advertised in the medical journals. Seeing that the work of the combined hospitals will require the services of a staff nearly equal to the sum of the existing staffs, including the various specialists whom the North-West London Hospital can provide, we are inclined to think that this course would have formed a reasonable solution of the difficulty, or if it be found that fewer men are required a joint committee representing the committees and staffs of the two hospitals might recommend a new staff fairly representing both hospitals and relying on the public spirit of those not chosen to accept their retirement unhesitatingly. Unhappily, the chance of the adoption of such a *via media* has almost entirely gone, for since the final decision of the governors the members of the staff of the Hampstead Hospital have sent in their resignations to the council in a body, with the exception of the dental surgeon, and have asked to be relieved of their duties as soon as the council can make other arrangements for the staffing of the hospital, in which action they have the support of the Hampstead division of the British Medical Association. We print in another column a letter from the honorary secretary of that division in which he states the position of the local practitioners of Hampstead as indicated in the replies sent by a substantial portion of them to a circular inviting their opinion. Neither King EDWARD'S Hospital Fund nor the Hampstead staff, we are assured, will now go back on its position, the latter body having definitely decided to oppose both the amalgamation and the introduction of consultants. The whole position is most unfortunate. We greatly regret the impairment of the utility of the hospital which is bound to follow from this state of civil warfare, while the issues have been so confused as to make the task of those interested in the hospital's welfare an extremely difficult one.

Annotations.

"Ne quid nimis."

HEALTH OF LONDON IN 1907.

THE quarterly and weekly returns of the Registrar-General for 1907 enable us to supplement the recent valuable report on the health of London in 1906 by the medical officer of health of the county of London with an analysis of the vital statistics of the metropolis during the year just ended. Sir Shirley F. Murphy called attention to the constantly declining rate of mortality in the London population during recent years as conclusive evidence of improved health conditions. The death-rate in London per 1000 of the resident population, which was equal to 24·4 in the ten years 1861–70, has successively declined to 22·5, 20·5, and 19·6 per 1000 in the three more recent decades 1871–80, 1881–90, and 1891–1900. This continuous rate of decrease, satisfactory and remarkable as it was, has been considerably exceeded during the current decennium. The mean annual rate of mortality in London during the seven years 1901–07 has not exceeded 16·2 per 1000, showing a decrease of 3·4 from the much reduced rate in the preceding ten years 1891–1900, and being no less than 8·2 per 1000 below the mean rate in the ten years 1861–70. The decrease in the rate has, moreover, been practically continuous during the last seven years and was in 1907 unprecedentedly low. The London death-rate, which had been equal to 16·6, 15·6, and 15·7 per 1000 in the three preceding years, fell so low as 14·7 in the year just ended. The London rate of infant mortality, too, which was equal to 160 per 1000 births registered in the ten years 1891–1900, has not exceeded 135 per 1000 during the seven years (1901–07) of the current decade and was unprecedentedly low, 116, during last year. The London death-rate from the principal epidemic or infectious diseases, which was 2·2 per 1000 in the 52 weeks of 1906, also fell to 1·4 in 1907, mainly owing to the unprecedentedly low mortality from diarrhœa, principally infantile. The fatal cases of diarrhœa registered in London, which had been 4507 in 1906, fell to 1523 in 1907, a decrease which is only partly explained by the meteorological conditions during the past summer. No death from small-pox was registered in London last year, but the fatal cases of measles, scarlet fever, diphtheria, and whooping-cough were, of each disease, somewhat more numerous than in 1906. On the other hand, the deaths referred to "fever" (principally enteric) did not exceed 200, showing a decline of 75 from the number in 1906, and being the lowest number recorded in any year of which record exists. With regard to the increase in the fatal cases of scarlet fever from 533 in 1906 to 645 in 1907, it should be noted that while the annual number of deaths from this disease in London averaged 3439 in the ten years 1861–70 it successively declined to 2125, 1327, and 819 in the three succeeding decades, and has further fallen to 513 in the last seven years 1901–07. An inquiry, with a view to ascertain how much of this decline in the mortality from scarlet fever can be attributed to the hospital isolation of cases of this disease, would be full of interest and would be of real value to sanitary authorities. During the 52 weeks of last year 2667 deaths in the county of London resulted from different forms of violence, against 2794 in 1906; and 6868 inquests were held, the number in the previous year having been 6910. It is eminently satisfactory to note that with the exception of only 81, the causes of all the 69,953 deaths registered in London last year were duly certified by a registered medical practitioner or by inquest; the number of uncertified causes of death in London in 1906 was 146. The proportion of London deaths recorded in public institutions continues to increase and was equal to 38·4 per cent. during last year, exclusive of the deaths of London residents occurring in metropolitan institutions situated outside the county of London; in 1906 the proportion was 38·3 per cent. after the inclusion of the institution deaths occurring beyond the county boundaries. While awaiting with interest the Registrar-General's annual summary for 1907 relating to London and other large towns the foregoing figures afford conclusive evidence of the encouraging results of the constant growth of sanitary interest, activity, and organisation in London during recent years. This remarkable decline of mortality, which necessarily implies a corresponding increase in the duration of life, affords also a refutation of the constantly asserted increase of the physical deterioration of the nation, at any rate as regards the nearly five millions of population residing within the metropolis.

THE WINTER EXHIBITION AT THE ROYAL ACADEMY.

THE thirty-ninth annual winter exhibition of the Royal Academy was opened to the public on Monday and is a collection of great interest. Of the portraits which more immediately concern the medical profession there are two, the one (95) a portrait of Dr. T. Hanson of Canterbury painted by Zoffany, and the other (157) one of Abraham Cowley by Lely. As regards the former we have been unable to find any information concerning him, for he is not mentioned in either the "Dictionary of National Biography," or in Munk's Roll of the College of Physicians. Possibly he may not have been a Doctor of Medicine. As for Cowley the picture represents him after the fashion of the artificial pastoral heroes of the seventeenth and eighteenth centuries; he is sitting under a tree dressed in brown with long hair falling over his shoulders with a flageolet in his right hand and a long staff, possibly a crook, in his left. Cowley began to study medicine about 1656 and on Dec. 2nd, 1657, he was created M.D. at Oxford "by order of the Government," a piece of servility impossible in these days. With regard to the remaining pictures, the first room is devoted to early Flemish and Italian masters. Of these perhaps the most striking is No. 19, "The Adoration of the Kings," by Herri Met de Bles, a highly decorative and overcrowded composition shewing marked rococo characteristics. The fascination which metalwork exercised over the early Renaissance painters, many of whom were also goldsmiths, is well exemplified, for the central column which supports the architectural canopy under which the figures are grouped is apparently composed of a gigantic metal candlestick, nearly half of the base of which projects over the edge of the wall on which it rests. With regard to the other pictures in the exhibition we have only space to mention a number of Hogarths and magnificent examples of Romney, Raeburn, and Reynolds.

THE HOLDERS OF MIDWIFERY LICENCES.

OUR attention has been directed to a correspondence on the somewhat curious question whether a Licentiate in Midwifery possessing no other or registrable qualification could with propriety or safety engage in medical practice, either as principal or assistant, or could describe himself on a doorplate as "L.M., Obstetric Surgeon." It was asked whether the medical protection societies would think it necessary to intervene in such a case, and whether the General Medical Council would be likely to exercise its powers in relation to it. A midwifery licence was at one time given by the Royal College of Surgeons of Ireland, and was instituted by the Royal College of Surgeons of England about 1850, at a time when the diploma of Membership conferred a right to practise; and the intention was to enable Members to obtain from their own

College an official recognition of their knowledge of obstetrics. The only persons admitted to examination for the licence were either those who were already Members of the College or who possessed some other surgical qualification, or those who had completed the curriculum for Membership and had obtained all the necessary certificates for admission to examination. A student in this position might, as a matter of chance, present himself first to the Midwifery Board and pass and might thereafter either fail to present himself to the surgical examiners or present himself and fail to satisfy them. A Member of the College who was deprived of his diploma could not be deprived of his midwifery licence. It is only in one of these two ways that the holder of such a licence from the English College could now be destitute of a registrable qualification; and it cannot be said that either of them would justify an attempt to practise. The "unqualified assistant," who has been abolished by the General Medical Council, was, in nine cases out of ten, a student who had been unable either to finish the curriculum or to satisfy the examiners; and no individual coming under this head would be likely to receive an indulgence which was steadily denied to the class. For the licentiate now in question to call himself "Obstetric Surgeon" would plainly be to use a title implying that he was registered, and would be an offence under the Medical Acts. Fortunately, the question cannot now be of more than individual interest. The Coombe Hospital diploma was destroyed as a "qualification" by the Medical Act of 1858. The English and Irish Colleges have ceased to issue a midwifery licence, the last examination for which in England was held in 1875; it is probable that the gentleman referred to in the correspondence is now the only unqualified holder of a document which would be deprived of its only justification by the medical legislation of 1886, under which a qualification in midwifery is required from all practitioners. The "L.M." cannot even find shelter under the Midwives Act, the provisions of which are strictly limited to women.

A FROLIC OF VARIABLE WEATHER.

NOT a little alarm has been experienced in domestic circles by the appearance of considerable moisture on the walls and furniture of the house during the severe changes of temperature which we have recently experienced. Fears of the house being in an unhealthy damp condition have been entertained, and of some irreparable damage being done to the papers on the wall, the decorations, the piano, and other articles of furniture. The occurrence has given rise to a deal of apprehension as to the soundness of the building from the health point of view; and the conclusion has been reached by a good many, we dare say, that rheumatism, sore-throats, and other diseases engendered by damp are likely to follow in the wake of such a phenomenon. As a matter of fact, the appearance of moisture on the interior surface of a house under the conditions which obtained is no evidence at all that the house is damp. The truth is that the house and its contents are extremely dry previously to the onset of warm moist air which commonly happens when the wind changes from the easterly to the westerly direction. The moisture is derived exclusively from the warm air and not from the building at all. The house is still cold, and warm moist air coming into contact with the cold surfaces deposits some of the moisture with which it is saturated. Everyone is familiar with the deposition of moisture which takes place on a cold tumbler or glass when it is brought into a warm room. In the phenomenon referred to the house is, so to speak, the tumbler and the moist westerly breeze is the warm room. As a rule no harm is done, the separated moisture disappearing as the house recovers from its cold condition. Fabrics appear to be uninjured by the visitation and even blistered paper settles down again, leaving little or no evidence that anything of the kind had taken place. Neither is the healthiness of the house affected in the least degree. The action is simply that of a cold mass condensing moisture out of a water-saturated air, the damp itself not residing in the house at all but in the air. The preventive and remedial measures are the same—the house should be kept thoroughly warm.

THE ASSOCIATION OF PUBLIC SCHOOL SCIENCE MASTERS.

THE annual meeting of the above association will be held by the kind permission of the head-master at Westminster School on Tuesday, Jan. 14th. The meeting will last from 10 A.M. until 7 P.M. The President, Dr. Henry Miers, F.R.S., Waynflete professor of mineralogy in the University of Oxford, will take the chair at 11 A.M. and will deliver an address upon the Order in which Science Subjects should be Taught (*a*) in Public Schools, and (*b*) in the Universities. The address will be followed by a discussion upon the Teaching of Mechanics opened by papers read by Mr. C. F. Mott of Giggleswick and Mr. H. Wilkinson of Durham. In the afternoon there is to be a discussion upon the Teaching of Physics opened by papers read by Mr. C. Cumming of Rugby, Mr. W. E. Cross of Whitgift, and Mr. J. M. Wadmore of Oldham. The programme of the conference certainly gives promise of useful performance and we wish the association success.

THE RETIREMENT OF THE MEDICAL OFFICER OF HEALTH OF THE TRANSVAAL.

THE immediate retirement is announced of Dr. George Turner, D.P.H. Cantab., J.P., Cape, Transvaal, and Orange River Colonies, who since 1901 has served with great and successful energy as medical officer of health of the Transvaal. He retires on completing his sixtieth year, an event which will bring to a close a distinguished public career in the ranks of preventive medicine. He was educated at Cambridge and Guy's Hospital and at the age of 25 years was appointed medical officer of health and public analyst of the Borough and Port of Portsmouth and also physician of the Portsmouth Fever Hospital. He held these posts for seven years and in 1880 relinquished them to become medical officer of health of the Hertfordshire and Essex combined sanitary district which was under his able control until 1895; during the last 13 of these 15 years he was lecturer on hygiene at Guy's Hospital and was also an examiner in public health to the Conjoint Board in London. In 1895 he proceeded to South Africa, having gained the appointment of medical officer of health of the Cape Colony, where the value of his services soon became apparent both in connexion with the public health of its inhabitants and also with the suppression of rinderpest which was then raging furiously amongst the cattle. Dr. Turner took charge of the Kimberley rinderpest station in 1897 and during the five years of his service in Cape Colony he is said to have saved the Colony "something like a sum of six millions sterling" by his treatment of this disease. His connexion with Cape Colony ceased with the war, as in 1900 he was seconded as sanitary adviser for service with Lord Roberts in the Transvaal, and in the following year Lord Milner appointed him medical officer of health of that colony. Here he again attacked rinderpest vigorously and established a serum factory at Dasspoort which enabled him to cope with the epidemic in somewhat disadvantageous circumstances. He still further enlarged the scope of his public activities and in 1904 successfully undertook the compilation of the first census of the Transvaal and Swaziland; at the same time he was a member of the Legislative Council of the Transvaal, to which he was elected in 1903 and on which he

served until its dissolution in 1906. The great feature of his work in the Transvaal, however, has been his superintendentship of the Pretoria Leper Asylum for the past seven years. He found it with 90 patients and leaves it with 400, and has devoted a large amount of careful clinical study to each case under his charge with the result that he has become an authority on the disease. It was hoped that an arrangement would be made by the Transvaal Government which would enable him to continue to hold this post in the Leper Asylum but the remuneration which has been offered to him is not such as he could reasonably accept. Dr. Turner's distinguished public services are admitted at every hand and we consider it very desirable that his Government should see its way to retain them in a connexion in which they are of special value, an opinion that has been fully expressed in a resolution passed and brought before the Transvaal Government by its Medical Council. Should his retirement ensue we wish him many years of honourable ease and we are assured that he will bring home with him from South Africa the gratitude of many friends, if not of the Government which he has served so well.

COMPLETE INVERSION OF THE UTERUS.

AN interesting case of this kind is recorded in the present number of THE LANCET by Mr. Arthur Maude. The inversion was a complete one and associated with total prolapse of the uterus which lay outside the vulva. No undue traction had been made upon the cord and the labour had apparently been spontaneous and rapid. The placenta was attached exactly to the fundus of the uterus and in this fact Mr. Maude is inclined to see a partial explanation of the occurrence in accordance with the hypothesis put forward by Hennig that such an attachment of the placenta is likely to produce this accident. Some support is given to this view by the inversion of the placenta which undoubtedly often occurs during its normal expulsion when it is attached in this position. In these cases there is usually a large retroplacental hæmatoma and there is no improbability in supposing that in cases of rapid or almost precipitate labour, as in the present case, some inversion of the uterus may accompany that of the placenta when the organ has not time to accommodate itself to the new conditions and remains flaccid and partly empty. The tendency would naturally be for a flaccid uterus to follow down the escaping child and placenta and for inversion to occur. A similar mechanism is probably at work when the uterus, after it has been successfully reinverted, tends to follow down the hand as it is withdrawn from its cavity. No doubt this accident must be accompanied by complete atony of the whole of the uterine musculature, and the old view put forward by Matthews Duncan and others that a partial atony of the placental site alone may account for it is no longer held by the majority of obstetricians. Numerous theories have been put forward to explain this dangerous complication of labour, but whatever the contributory causes may be the actual exciting cause is usually to be found in a sudden pressure applied to the upper part of the uterus, the result either of some sudden straining effort on the part of the patient or of undue force applied to the fundus of the uterus in an injudicious and improper attempt to express the placenta. A further contributory cause is to be found in the size and weight of the placenta and in his case Mr. Maude remarks that it was of considerable size. The extreme collapse which accompanies this accident is always interesting; it is commonly due to the severe hæmorrhage but it may occur when very little blood has been lost and its explanation then is not so simple. Possibly in some cases it is caused by sudden lowering of the intra-abdominal pressure, in others by stretching or tearing of some of the sympathetic nerve fibres in the uterine wall, or by the excessive dragging on the uterine appendages, especially the ovaries, which must occur. The extreme rarity of this accident is proverbial, at any rate if we consider the figures obtained from lying-in hospitals alone, such as those which Mr. Maude quotes. At the same time, it must be remembered that the publication of cases occurring in the private practice of midwives or medical men is by no means uncommon, and it would appear almost as if this accident was one especially likely to occur in such conditions—a supposition which lends some support to the view that as a rule it is related to some error in the management of the labour, especially of its third stage. Mr. Maude is to be congratulated on the successful issue of his case, as the immediate mortality even at the present day is very high, amounting to as much as from 14 to 22 per cent.

PUBLIC VACCINATION IN OLDHAM.

IN our issue of Dec. 21st, 1907, we referred to the situation in Oldham as regards the appointment of a public vaccinator. Shortly, the position was as follows. The guardians originally proposed to appoint a public vaccinator who was to give his whole time to the work and to receive a salary of £500 per annum. Owing, however, to recent legislation this scheme was dropped and it was proposed to pay the public vaccinator in the usual way by fees on the minimum scale—i.e., 2*s*. 6*d*. per case, with an additional £15 per annum for a dressing station, he having to give his whole time. Eventually Dr. J. P. Walker of Earlestown was appointed but he declined to accept the appointment on the ground that the terms did not afford a living wage. What the income may be can be seen from the following figures for the quarter ended Dec. 31st. Notices are paid for at 1*s*. each and successful vaccinations at 2*s*. 6*d*. each. For the three months in question there were 270 notices amounting to £13 10*s*. and 208 successful vaccinations amounting to £26, a total of £39 10*s*. for the quarter. For the year therefore the total sum may be £158 which with the addition of the £15 for the dressing station makes £173 per annum, and this is certainly not a sufficient salary for a whole-time appointment. The guardians, we learn, are willing that the minimum salary should constitute a living wage but they decline to state what amount constitutes a living wage. As we mentioned before, the local medical men have expressed their willingness to accept a yearly salary of £350, a sum which we call modest, and as the guardians were originally willing to give £500 we hope that they will see their way to grant at least the £350. The post, we learn from the *Oldham Evening Chronicle* of Dec. 31st, has now been offered to Dr. Leigh of Bolton.

THE TOMB OF AN ANCIENT EGYPTIAN PHYSICIAN.

THE excellent work upon "The Burial Customs of Ancient Egypt" by Professor John Garstang, just published by Messrs. Archibald Constable and Co., for the first time gives a scientifically complete record of the contents of the sepulchre of an Egyptian physician, and in this case of a personage who flourished under the twelfth dynasty, *circa* B.C. 2000. The deceased, whose tomb is described, was named Nefery and in all the numerous repetitions of his name upon the two coffins provided for him is termed "a physician." That he either came of a wealthy family or amassed wealth by the practice of his profession is proved by the expense that was lavished upon his burial, his funerary furniture being one of the most complete sets of such appointments found in other than princely tombs at Beni-Hassan where he was interred. Various and many as were the objects deposited beside his body only two of these can in any way be considered

as connected with his vocation. These are a set of writing implements, consisting of a writing tablet and a pen box, the latter furnished with a number of reed pens ready for use. The writing tablet, which together with the pen box was placed upon the lid of the outer of Nefery's two coffins, was coated with stucco and then painted, and the surface so carefully smoothed by some polishing process that it was probably possible to remove any temporary memoranda made thereupon as soon as their purpose was fulfilled. At one end of the pen box were two ink-wells in which the remains of a red and of a blue-black ink can be detected. Unfortunately no written notes survive upon the palette. Among the objects found in the tomb are some beautiful models of Nile boats, one having 20 rowers; also an imitation of a granary and many figures of domestics and labourers. The inner coffin, or sarcophagus, bore some quite new texts to scholars of the most archaic Egyptian religious books and explained that Nefery was a devotee of Osiris. The body had been laid upon its side wrapped in folds of linen cloth and was not mummified. The head was encased in a painted cartonage. This physician's tomb has been rearranged, as it was when first reopened, in the Cairo Museum where it is the subject of much interest.

THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN SQUARE.

IN connexion with the approaching jubilee of this hospital, H.R.H. the Duchess of Albany has written a letter accompanying a circular issued by the hospital authorities. In this letter Her Royal Highness expresses the deep interest which she has in the welfare of the institution—an interest which has been shown on many occasions and in an exceedingly practical manner. The secret of this interest is in some degree, at least, to be ascribed to the fact that the hospital is a memorial to the late Duke of Albany, whose help in its successful development, especially in connexion with the rebuilding in 1885, was both sustained and practical. Yet Her Royal Highness has herself developed an interest in the hospital which has extended now over a good many years and certainly does not become less with the lapse of time. In no hospital in London was the element of what may be called scientific romance more interwoven with the development of a hospital than in this. Commenced at first at the instance of two ladies, one of whom, at least, was a sufferer from one of the forms of illness which it was instituted to relieve, and depending in its early days on the actual work which these ladies did with their own hands, it received its official recognition at a Mansion House meeting in 1859. In its early days it was fortunate in attracting to its practice men of mark like Brown-Séquard, Russell Reynolds, Hughlings Jackson, Buzzard, Bastian, and Gowers, and latterly Ferrier, Beevor, Ormerod, Victor Horsley, and others have become incorporated in its fame and its progress. Between 1880 and 1890, Queen Square was certainly the centre of neurological interest in this country, and it is probably not incorrect to say that it was the centre of neurological progress in Europe. This fact is attested by the numbers of medical men who began to attend its practice then and who have continued to do so in ever-increasing numbers up to the present time. And it may be asserted that its students are drawn from every European country, from Canada, the United States, Australia, and South Africa, so that it may be said to have established a claim to be more than a national hospital, more even than an imperial institution. In the circular which accompanies the letter above referred to particulars are given of the rise and progress of the hospital. An interesting map is appended, on which are indicated the number of the patients from the different counties of England and Wales and also the numbers from Scotland, Ireland, European and Asiatic countries, the United States, and English colonies. From this map it is obvious that from the point of view of the relief of sufferers the hospital makes at least as wide an appeal as it does in the matter of instruction in neurology. The requirements of such an institution are many. They are constantly increasing and varying and they cost money. In the appeal, which Her Royal Highness supports with cordiality and cogency, the necessity for various extensions and improvements in the present accommodation is very clearly detailed. It is to be hoped that this great hospital will not be hampered in its good and beneficent work and that its opportunities for the relief of suffering, the investigation of the problems of nervous disease and the dissemination of the knowledge so acquired, may not be in any way curtailed by want of money. We anticipate that great success will attend the efforts of the jubilee committee over which the Duchess of Albany has consented to preside, and we are sure that the whole medical profession will join in hoping that the hospital authorities will be enabled to carry out all their projected improvements.

THE DEATH OF DR. W. BAYARD.

THE death is reported, at the age of 94 years, of Dr. William Bayard who for 70 years had practised medicine in St. John, New Brunswick, and who continued in active work practically to the last. Dr. Bayard was born in Kentville, Nova Scotia, the son of Dr. Robert Bayard who had removed from New York to the provinces on the outbreak of the American Revolution and settled later in St. John. He graduated from the University of Edinburgh in 1837 and soon after began practice in the town adopted by his father. He was the founder of the St. John General Public Hospital, was chairman to the hospital commission for many years, and at various times had been chairman of the New Brunswick Medical Society and president of the Council of Physicians and Surgeons. He was coroner for 28 years, chairman of the provincial board of health, and in 1895 president of the Canadian Medical Society. In August last, on the seventieth anniversary of Dr. Bayard's graduation, the Faculty of the University of Edinburgh conferred upon him the honorary degree of LL.D. *in absentiâ*, the letter accompanying it stating that Dr. Bayard was believed to be the oldest living graduate of the University. Dr. Bayard's wife died in 1876; there were no children.

DECEMBER AT HOME AND ABROAD.

VISITORS from these islands to the south of Europe may in some cases have been surprised at the occasional chilliness of the atmosphere and cold winds, as well as disappointed at the frequency and quantity of the rain, but generally the weather was more sunny than in this country, even in the most favoured localities, and the afternoons were always warmer. With the temperature of the nights, however, it was not everywhere the same. After sunset the Scilly Isles were milder than many of the resorts of the Riviera and in northern Italy, and Sandown, Plymouth, and Torquay were no cooler than Nice and warmer than Florence. The foreign resorts had the great advantage of escaping the cold, cutting easterly wind that set in over this country after Christmas Day. It was this sudden change from autumn to winter that brought down the mean temperature of the month in these islands; previously it had been very high for the time of year, the thermometer rising frequently to well above 50° by midday and not sinking much below that point at night except in the midlands and north. Over the southern portion of the Mediterranean, as represented by Malta and Algiers, the month was both fine and warm and the day temperature at Palermo was also high. The favourite resort of Biarritz suffered much from heavy rains and boisterous winds during the earlier half of

the month but the temperature was never low, and the second moisty brought ample compensation. Among the inland districts Berlin was by far the coldest; as many as 18 of its nights were frosty and towards the end of the month the cold became very severe, the sheltered thermometer showing 14° of frost. Brussels was also cold and often frosty, while at Paris the days were slightly colder and the nights appreciably colder than in London. Harrogate was colder than the Midlands and slight frost was very common, while its mean temperature was exactly 5° lower than that at Bath.

—	Highest temperature.	Lowest temperature.	Mean maximum temperature.	Mean minimum temperature.	Mean temperature for month.	Range of temperature.	Days with rain.	Total fall in month.
	°	°	°	°	°	°		* ins.
Scilly	55	41	51	46	48·4	5	22	4·51
Jersey	58	33	50	42	46·3	8	16	3·23
Plymouth	56	32	49	42	45·3	7	23	4·83
Torquay	57	34	50	42	45·6	8	20	4·37
Weymouth	57	32	48	41	44·7	7	16	3·67
Bournemouth ...	57	32	47	40	43·7	7	16	4·29
Brighton	55	32	46	40	42·9	6	11	1·98
Sandown, Isle of Wight	57	33	51	42	46·1	9	14	3·47
Bath	57	29	47	38	42·1	9	13	4·94
Harrogate	52	29	42	32	37·1	10	16	3·66
Manchester	54	29	45	37	41·0	8	14	2·83
Nottingham ...	55	27	44	35	39·6	9	11	2·56
London	57	33	47	39	42·6	8	14	3·06
Paris	58	24	46	36	40·9	10	11	1·90
Berlin	48	18	38	31	34·5	7	14	1·91
Brussels	55	23	43	33	38·0	10	15	1·68
Nice	64	32	54	42	48·0	12	7	4·41
Genoa	68	39	55	48	51·4	7	16	9·67
Florence	62	29	55	40	47·4	15	14	3·32
Rome	64	30	56	45	50·5	11	13	5·64
Naples	62	39	57	48	52·3	9	19	9·71
Palermo	69	34	63	48	55·1	15	8	2·50
Malta	70	42	63	54	58·7	9	6	0·44
Algiers	73	41	67	54	60·1	13	10	1·54
Biarritz	68	40	61	47	54·2	14	15	7·44
Lisbon	63	46	58	52	54·9	6	12	3·83

* A day with at least 0·04 in.

ASPIRATION.

UNDER the above heading Dr. Lachlan Grant delivered an illuminating address to the Mutual Improvement Society of Ballachulish on Dec. 6th, 1907. Man, he said, must aspire, and many great thinkers, notably Carlyle, have said the same thing. Dr. Grant divided his address into four headings—namely, personal, local, national, and international aspiration. As regards the second of these heads he pointed out that individuals may desire something for themselves which may or may not benefit their neighbours, "but a community banded together for a common object will desire something *pro bono publico*, and therefore all concerned should see it their duty to take part in it." Professor Gilbert Murray in his recently published work, "The Rise of the Greek Epic," has shown how the idea of service to the community was more deeply rooted in the Greeks than in us. Judging by their literature the question they always asked about statesmen and such-like was, "Does he help to make men better?" And what a high view Plato took of the subject is shown by the remark which he puts in the mouth of Socrates in the "Gorgias," where, talking of the great democratic statesmen of Athens, he denies that they have made Athens better or happier. "For they have filled the city full of harbours and docks and revenues and all that, and have left no room for justice and temperance." (Jowett's translation.) Modern municipalities may well ponder this saying. Speaking of international aspiration Dr. Grant was naturally led to mention how the nations of this world are gradually drawing nearer together to work for the common good. The recent Peace Congress at the Hague, the Parliament of Religions that met at Chicago during the last exhibition, and the various international congresses all point to the fact of a desire for the common good. Dr. Grant, however, is no misty idealist, for he realised to the full the fact that after all "preservation is the first law of Nature and that we must occasionally trample on each other's corns. ..... But we may all help to minimise the pain and the unpleasantness," and, concluded Dr. Grant, "those who can see visions of the new Jerusalem can at least work in the purifying spirit of hopefulness for the universal acceptance of those larger ideals and deeper conceptions that in the course of time may bring us nearer to the kingdom of Heaven upon earth." These ideals may well be before us at this beginning of a new year and the medical profession in particular has a great task before it in striving to lessen the amount of sickness, of infantile mortality, of drunkenness, of bad housing, and of prostitution. Both legislators and medical men may take to heart those wonderful stanzas of Blake:—

"Bring me my bow of burning gold!
Bring me my arrows of desire!
Bring me my spear: O clouds, unfold!
Bring me my chariot of fire!

"I will not cease from mental fight,
Nor shall my sword sleep in my hand,
Till we have built Jerusalem
In England's green and pleasant land."

That is the spirit of the true reformer and the one in which all of us should work.

SIXTY-ONE EYE OPERATIONS IN ONE DAY.

AN anonymous correspondent recently made, by means of the Indian lay press, the extraordinary statement that Indian civil surgeons had no incentive to keep up their professional knowledge and consequently degenerated into medical fossils who would fairly startle their brethren at home. Although writers of this stamp never add weight to their assertions by citing concrete instances but rely entirely upon specious generalities, they do occasionally meet with credence among honourable people who naturally assume that the calumniators are as honourable as they are themselves. In order to show the utter lack of foundation for this disgraceful charge it is only necessary to refer to the *Indian Medical Gazette*, a journal of the highest class, which since the year 1865 has been edited and mainly supported by officers of the Indian Medical Service. In the December number Captain H. A. J. Gidney, I.M.S., publishes a remarkable article under the heading which we have borrowed, dealing with an ophthalmic surgeon's work in the mofussil and incidentally showing some of the difficulties which he had to surmount. On Sept. 25th last Captain Gidney proceeded to an outlying village, about 20 miles from his station, and commenced work at 8 A.M., continuing, with half an hour's interval for lunch, until 4 P.M. when the light began to fail. He had no ambition to achieve a record but worked steadily on, devoting from six to eight minutes to each case. Had the light remained he could have performed nearly 100 operations but as it was he found on ceasing work for the day that no fewer than 61 cases had been attended to, as follows: extraction of senile cataracts, 52; extraction of congenital cataracts, six; iridectomy, two; and pterygium, one. Of these 61 operations 60 were entirely successful. The sixty-first was a partial failure

because the operator's De Wecker's scissors had got blunt and tore the iris instead of making a clean cut. When Captain Gidney arrived at the village he found about 250 blind people waiting for him. Of these, "at least 100 had been operated on by that well-known destroyer of eyes—i.e., the 'rawal,' or village eye-quack." After examination of the whole number about 100 were set apart as suitable for operation. An assistant was then deputed to prepare the eyes by cutting the lashes of both upper and lower lids. He also washed the patient's faces with soap and water and applied a weak solution of corrosive sublimate not only over the skin but also to the conjunctivæ. The cases were then ranged in rows for the insertion of cocaine seriatim. "By the time the first case had been operated on the next eye was thoroughly cocainised." Finally, Captain Gidney, having first assured himself that the lacrymal sac was healthy, again disinfected the eye which he was about to open. He also applied a drop of adrenalin solution and effected "another instillation of cocaine." No time was lost but there was no hurry, each of the several steps being methodically carried out. In its editorial columns the *Indian Medical Gazette* refers to Captain Gidney's indictment of the itinerant "couchers" who roam from village to village in every province in India and do incalculable harm by destroying eyes which could otherwise have been properly treated by civil surgeons and their assistants in the various Government dispensaries. Our contemporary invites correspondence on the subject and is of opinion that if a sufficiently good case can be made out the Government will probably take steps to check the unrestrained practices of these people.

THE RÔLE OF NITROGEN AS FOOD, POISON, AND EXPLOSIVE.

EVERY student of elementary chemistry will remember how comparatively uninteresting nitrogen gas appeared to be. It seemed to him to have no characteristics, it did not burn under ordinary conditions, it did not assist combustion, it was colourless and odourless, and on the whole its properties as an elementary gas were decidedly negative, and its occurrence seemed to be only capable of proof by showing that all other gases were absent. Yet its very inertness is probably the secret of its potentiality. Nitrogen loves to be free; it declines in so many of its compounds to stay long in a state of combination with other elements, and so the familiar nitro-explosives are very powerful. It evinces, however, a more restful condition when it is associated with carbon and hydrogen, and especially when oxygen is absent. But here again it represents a very powerful combination in the shape of that great and important class of bodies the proteins, which are indispensable for the nourishment of the body. The same elements, however, may be combined to form a powerful poison instead of a food. Prussic acid, like protein, contains the three elements, nitrogen, carbon, and hydrogen, but in different proportions. We find nitrogen appearing, therefore, now in a powerful explosive, now in a poison, again in a food, and, finally, as a harmless diluent of the oxygen in the air which we breathe. It ministers to the needs of both peace and war, it may serve the purpose of the poisoner, it may fill the hungry with good things, and the greatest source of it is the pure and apparently innocent atmosphere. Human ingenuity is successfully converting the nitrogen of the air into nitrates wherewith to feed the plant and the same substances may be utilised also to make the powerful weapons of modern warfare. In times gone by another chemical element—to wit, iron—served equally in the cause either of peace or war. "They shall beat their swords into ploughshares and their spears into pruning hooks; nations shall not lift up sword against nation, neither shall they learn war any more." Nitrogen is now rapidly replacing the sword in warfare and the question whether that element goes to the benignant usages of the soil or to the malignant purposes of the shell depends upon whether it is peace or war. Nitrogen is thus, so to speak, the modern ploughshare or sword as the case may be.

"DRUNK OR DYING."

ANOTHER of those unfortunate cases has occurred in which a house surgeon after thoroughly examining a patient suffering from a condition which might be due to alcoholic intoxication or to injury concludes that the former is the case and dismisses him from hospital with the result that he dies at his own home a few hours later. The present instance occurred at the Northampton General Hospital, to which a poor fellow was taken with the story that the wheels of a loaded wagon weighing 2¾ tons had passed over his body and face. He was twice thoroughly examined by two resident medical officers who found that the accident could not possibly have occurred as it was described by his friends, for there was no trace of a wheel-mark on the clothes or the body. From his general condition they considered that he had been drinking heavily and this impression was corroborated by the appearance of a gang of men who crowded into the receiving-room with him and had to be dismissed. No fracture was found and according to the evidence of the house surgeon the man's condition was typically "alcoholic," the only evidences of an accident being some epistaxis, a little bruising in the right groin, and pain in the right thigh. No bones were found broken. After the man had been detained for one and three-quarter hours he was discharged by the assent of the two house officers, but on reaching home he became much worse and a medical man hastily summoned arrived only in time to see him die. This gentleman stated at the inquest that the cause of death was, in his opinion, shock due to the injuries received by a man in poor health. He did not consider that the deceased was under the influence of alcohol when he first saw him but he knew that he always spoke peculiarly and he himself had sometimes thought him to be under the influence of drink when such was not the case. He had performed a post-mortem examination and he was sure the wheel could not have passed over the deceased as had been described. The thorax, the ribs, and the abdomen were perfectly sound but the lower part of the body was bruised and "seriously injured internally." It would, he considered, be impossible to discover this on the first examination. The coroner questioned this witness and the house surgeon very closely on the man's dismissal from the hospital. The jury found the cause of death to be accidental and added a rider to their verdict to the effect that they thought the doctors were wrong and inhuman to send the deceased out of the hospital in a dying state and they saw no reason to believe that he was under the influence of alcohol at the time. We are glad to be able to add that the board of management of the hospital having thoroughly investigated the matter has reported that both the resident medical officers acted with the greatest skill and kindness, and has communicated to the local newspapers the following resolution, which was passed unanimously:—

> That the board having received this report from its chairman connected with the death of Joseph Marks is of opinion that the charge of inhumanity brought against the resident medical officers is without foundation; that they appear to have made a very careful examination of the injured man and to have found no serious injury of any kind; and this fact was fully borne out by the post-mortem examination.

We are very pleased to record that the hospital has supported its resident medical officers so strongly and sympathise with those gentlemen on the unfortunate incident. Anyone who has ever been a house surgeon must know the

appalling difficulty of these cases, the moral of which seems to be that they had better be kept in for 24 hours if there is a shadow of a doubt about their nature, even if an extra bed has to be made up to accommodate them.

AN important paper will be read at the meeting of the Surgical Section of the Royal Society of Medicine to be held at 20, Hanover-square, London, W., on Tuesday, Jan. 14th, at 5.30 P.M., by Mr. Harold L. Barnard, on Some Aspects of Subphrenic Abscess. The paper is based upon 76 consecutive cases, of which 21 were operated upon by Mr. Barnard. It is expected that a good discussion of this serious condition will be elicited by this communication. Among many points of interest Mr. Barnard's statistics show that of the cases not operated upon all died. The subject is one which concerns the physician no less than the surgeon and it is hoped that members of the Medical Section will be present and will take part in the discussion.

A TELEGRAM from the Governor of the Mauritius received at the Colonial Office on Jan. 3rd states that for the week ending Jan. 2nd there were 3 cases of plague and 3 deaths from the disease.

MEDICINE AND THE LAW.

The Burning and Overlying of Children.

A REPORT in the *Daily Telegraph* recently stated that a coroner's jury in St. Pancras had before it not one but several inquests in which the suffocation of children had occurred from their sleeping in their parents' beds and that when the same jury had taken part in another inquiry concerning the death of a child from burning due to the absence of a fireguard an opportunity was afforded to the coroner for calling their attention to the Bill recently before Parliament affecting these two dangers to infant life. As a result the jury added to their verdict of accidental death in the burning case a rider intimating their strong approval of the proposed legislation. We note that the same newspaper has since reported other cases of the burning of children and it is to be hoped that attention may in this way be drawn to the matter, so that the support of favourable public opinion may be accorded to a measure which will no doubt be reintroduced during the coming Parliamentary session. The Bill in question may be described as a coroners' Bill, due to the experience acquired by these gentlemen in presiding over inquiries which owing to their sameness and frequency are often not accorded publicity and it therefore has a great weight of expert opinion behind it. It is, however, a private Member's Bill and as such its passing is likely to be postponed indefinitely unless it can secure support from the Government, which, so far as it is possible to judge, will find its time fully occupied in pressing forward its own political measures in the face of opposition. The Bill to which we have referred has in its favour the fact that it has no political bearing but proposes only to protect helpless children from suffering and death, and that it imposes fresh duties of care upon their parents in terms so brief that lengthened discussion with regard to them can hardly take place. If public opinion were to be aroused and expressed in its favour it would no doubt obtain that recognition at the hands of those in power which, as we have suggested, it deserves, and it is to be hoped that possibly it may do this on its merits. In such an event it can hardly be likely that it would meet with direct opposition of any importance in either House.

Malt Vinegar.

A fine of £1 was imposed recently by the Acton magistrates upon a tradesman convicted of selling as "malt vinegar" a liquid consisting of 30 per cent. only of malt vinegar combined with vinegar prepared from acetic acid and colouring matter. The defence was to the effect that that which was handed to the inspector was sold as "wood vinegar," but his evidence was that he had asked for malt vinegar and had paid 2*d*. for a pint of the liquid which was in a vessel not labelled. Evidence was given that one pound of acetic acid, costing 4*d*., would make two gallons of "vinegar."

Death from Heat on Board Ship held to be an Accident.

Among the most important extension of compensation under the new Workmen's Compensation Act is undoubtedly that which enables seamen to claim for the accidents incidental to their calling. An interesting case has recently been decided at Belfast by his honour Judge Fitzgibbon who has held that the death of a stoker who died on board the White Star steamship *Majestic* in mid-Atlantic from the effect of heat was due to an "accident" within the meaning of the Act and accordingly conferred the right to compensation upon his widow. The case is one upon which there will naturally be an appeal arising, as so many have arisen already, out of the use of the popular and somewhat indefinite word "accident." The facts were hardly in dispute. The deceased was a small man, not naturally of strong physique, who had endured privations and hunger in New York and had been shipped in order that he might work his passage home through the intervention of a seamen's mission. When in the stokehold raking the furnaces at a temperature where he stood of 96° F. and where, close by, the thermometer reached 114°, he had been seen to fall suddenly and had died in the hospital two hours later. He was buried at sea on the same day and the cause of his death was entered in the log as "heat-stroke and exhaustion." The question for the county court judge therefore resolved itself into whether the effect of the heat of the boilers upon the workman was an accident arising out of his employment which would entitle his widow to recover. The medical officer of the ship stated in cross-examination that during four years he had seen four cases of death from similar causes. The result of the decision, if it is upheld upon appeal, will no doubt be to render employers unwilling to engage men whose physical condition is unsuited to the strain likely to be imposed upon them, and another difficulty will be placed in the way of middle-aged men obtaining work. Employers will also be alert to improve as far as possible the circumstances in which their work is carried out, but it will be impossible to render the conditions of stoking anything but excessively arduous.

Looking Back.

FROM

THE LANCET, *SATURDAY*, Jan. 9th, 1830.

I may mention generally, that in the treatment of ulcers, such as require that the patient should be confined to his chamber and not to bed, it may be necessary that he should be on what we call a sick diet. It is totally improper to let him be living on animal food and fermented liquors. If you allow that, it will frustrate all your means. A strange notion exists in the minds of medical men, that where they see a sore which is discharging, it is necessary to give nutritious diet, and allow wine and so forth, to support the system under that discharge, when in fact the evil probably proceeds from an already over-full state of the constitution. This is a most injudicious way of treating such cases. On the contrary, you will very frequently find it necessary to take blood, and to reduce the diet still further, in the progress of affections of this kind.

I should mention to you further, that when large ulcers are healing very rapidly, it is necessary to pay great attention to the same points, in order to prevent the occurrence of other serious mischief. When an active disease of this kind, in any part of the body, is put a stop to, unless great attention is paid to all the points I have mentioned, there is much reason to apprehend that some other parts of the frame will become affected: and I have known many instances, under such circumstances, where persons have been allowed a full diet, that the healing of the ulcer has been speedily followed by an attack of palsy, or some serious disease either in the chest or abdomen.[1]

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[1] Excerpt from "Lectures on Surgery, Medical and Operative, delivered at St. Bartholomew's Hospital; By Mr. Lawrence. Lecture XV. Ulceration."

BORIC ACID IN CREAM.

Cullen v. *McNair.*

THIS was an appeal from a conviction by Mr. Curtis Bennett at Westminster police court for selling cream containing boric acid to an extent injurious to health (Sale of Food and Drugs Act, 1875, Sec. 3).

Mr. W. R. Bousfield, K.C., Mr. E. Page, K.C., and Mr. G. Elliott appeared for the appellant, instructed by Messrs. Neve, Beck, and Kirby.

Mr. McCall, K.C., Mr. Courthope Munro, and Mr. W. F. Clark, instructed by Messrs. Allen and Son, represented the respondents—the Westminster city council.

The case was heard by Mr. Robert Wallace, K.C., and other justices at Clerkenwell on Oct. 31st, Nov. 8th, and 18th, 1907, when a large number of witnesses were called on both sides. The cream in question was sold in a pot on which was a label to the effect that it contained a small percentage of boron preservative to retard sourness. The amount of boric acid found in it by Mr. C. E. Cassal, the public analyst, was 21·91 grains to the pound; and he stated in evidence that in his opinion if a preservative was present in a sufficient amount to exert a substantial antiseptic action on food it must of necessity injuriously interfere with the process of digestion. The cream contained 52 per cent. of fat.

Mr. REGINALD HARRISON, F.R.C.S., narrated his experience with boric acid in connexion with urinary fever.[1] He had found that by its use operations on the urethra and bladder could be performed without fever resulting, but he was forced to abandon its use because the patients were made ill otherwise by the remedy. Flatulence, nausea, and often disturbance of the heart's action resulted and occasionally eruptions on the body and other symptoms occurred. As boric acid was chiefly excreted by the kidneys he had not the slightest doubt that boric acid in the proportion contained in this cream, and even in smaller quantities, would tend to intensify any disease of the kidney even in an incipient stage. The long-continued exhibition of small doses appeared to produce the same result as the use of large doses extended over a shorter period. The witness did not agree with the conclusions of Liebrech and Tunnicliffe. Experiments extended over a comparatively short time were not to be compared with what occurred in every day life when people went on for months and months consuming quantities of boric acid in their food.

Dr. W. D. HALLIBURTON, professor of physiology in King's College, London, stated that in his opinion the consumption of boric acid in any quantity was injurious; it brought about digestive disturbances, but of course different people were differently affected. Its addition to milk caused the lime salts to be thrown out and in this way if cream be added to milk, as was now very generally done, in order to make cow's milk approximate more nearly to human milk the presence of the acid would destroy the value of the lime, making it absolutely insoluble. In this way persons consuming the mixture did not get their fair proportion of the lime which went towards making bone, and rickets might result. He agreed with Mr. Harrison as to the effect on the kidneys and also as to the fallacy of conclusions drawn from short experiments such as those of Tunnicliffe. Questioned as to the results obtained by Chittenden, he pointed out that the experiments were made on dogs and that they have a very resistant alimentary canal.

Dr. RALPH VINCENT, one of the physicians to the Infants' Hospital, said that if milk and cream were kept at a temperature of 40° F., there would be no necessity to use any preservative. The addition of boric acid to the foods of infants was likely to have more serious effects from the fact that as the feeding had to take place at short intervals the kidneys and digestive organs were continuously under the influence of the drug. The first effect produced in digestion in the stomach of the infant was the precipitation of the curd; boric acid interfered with this, and the child eventually suffered from sickness, diarrhœa alternating with constipation, which led to a condition of marasmus in which the child could no longer digest anything. Cream had largely taken the place of cod-liver oil and it was essential that it should be pure.

Dr. H. R. KENWOOD, professor of hygiene and public health in University College, London, considered the addition of boric acid to food as a positive danger. He had made some experiments on himself in 1903 and again in 1905 and on each occasion suffered from a train of symptoms now generally recognised as "borism." He attached high value to the experiments of Dr. Wiley, considering them by far the best which had ever been carried out with reference to boric acid. Reference was made to the report of the Commission of 1899 in which it was suggested that it might be permissible to allow 17½ grains to the pound. It had also been stated that the Local Government Board had issued a circular allowing a larger amount, but the witness pointed out that this was wrong, for if the amount (40 grains to the gallon) be worked out on the same basis it came to 3·88 grains per pound, which the Board now held should raise the presumption of injury to health. From his experience as a medical officer of health he was of opinion that in average homes a label on a jar afforded very poor protection. Medical men who recommended cream for their patients might not be aware that they were taking a boricised article.

Mr. HENRY DROOP RICHMOND, F.I.C., appeared on subpœna. He said that the Aylesbury Dairy Company, for which he had been analyst for 15 years, gave up the use of preservatives in cream 12 years ago. Previous to that time a small quantity of boric acid (0·2 per cent. or 14 grains to the pound) was used. The company sent out cream to customers twice or three times a day. If cream was kept it got thicker, reaching its maximum thickness about the third day. He had made experiments and found that cream to which 17½ grains of boric acid had been added would keep for five and a half days at a temperature of 60° F.; with 21 grains it would keep six and a half days; with 24 grains, seven and a half days; and with 35 grains, ten days. Without any preservative cream should keep good for about two days at the same temperature—viz., 60°. If put in cold storage for a day the cream would keep fresh for one and a half days after being sent out. 40° was the best temperature at which to keep cream, as if the temperature was near the freezing point then the cream on being taken out was apt to show a tendency to become churned by handling. As to the price, witness calculated that this boricised cream was sold at the rate of 4*s.* 6*d.* a quart, taking a pint of cream of the consistence of 52 per cent. of fat to weigh 21 ounces.

Dr. F. J. ALLAN, medical officer of health of the City of Westminster, said that his experience of the use of boricised cream on normal persons was that indigestion was produced. He believed that many people thought they could not digest cream, whereas it was the boric acid which upset them. Boric acid added to polluted cream might hinder the multiplication of organisms, but so soon as the cream was taken into the stomach the preservative would be absorbed and the organisms would have full play. Boric acid was not a severe poison but it was an insidious one, and its use continued over a lengthened period produced a detrimental effect on the organs of the body.

For the appellant evidence was given as follows.

Dr. J. C. THRESH, medical officer of the county of Essex, said that boric acid was not a poison in the popular sense any more than saltpetre was. If these or even common salt were given in extravagant quantities injurious effects would be caused. He considered that a reasonable amount of boric acid, say from eight to ten grains per day, would be innocuous. He considered that Dr. Wiley in his experiments made a fatal mistake in giving the preservative in large doses. Because large doses of any substance produced harmful effects it did not follow that small doses would have less injurious effects. He thought that boric acid might play a useful part in children's diet if it prevented the too rapid curdling of the milk, but he had had no experience of the feeding of infants with cream.

In cross-examination Dr. Thresh stated that he considered that 22 grains was more than he thought should be allowed in cream. 17½ grains would be preferable. He objected to preservatives in milk entirely. He objected to boric acid in quantities likely to be of any use in preserving milk. He thought that the use of boric acid was dangerous for people suffering from kidney disease and that it was likely to be so for those who had a tendency to kidney trouble. He objected to it being administered to invalids, dyspeptics, and babies, except under medical supervision, and certainly not by an ignorant milkman.

Dr. R. HUTCHISON, physician to the London Hospital, did not think that if as much as a quarter of a pound of this cream were taken in a day the amount of boric acid would do any harm to anyone. He knew of no medical evidence to prove that this drug was an abortifacient. Assuming that there was a choice of cream with and without boric acid he would rather order that without, because he did not see the use of admitting a foreign substance into the body if one was not obliged to, but he did not think that five grains a day administered to an infant would have any effect.

Dr. H. CAMPBELL THOMSON, physician to the Hospital for Paralysis and Epilepsy, said that he had prescribed borax preparations in considerable quantities over considerable periods without observing any ill effects. He believed that if anyone suffered from small doses of boric acid it must be due to idiosyncrasy.

Dr. T. F. VAISEY, medical officer of the Winslow district, where Messrs. Edwards's creamery is situated, said that the cream was prepared with the greatest care. He had used the cream for children who did not thrive on ordinary milk.

Dr. A. P. LUFF, physician to St. Mary's Hospital and one of the scientific advisers to the Home Office, did not consider the amount of boric acid in this cream would be injurious to the health of normal persons. He preferred to take boricised cream himself in summer time but he drew a sharp distinction between the general public and infants and invalids. He would allow up to 0·5 per cent. in cream but would draw the line there.

Mr. RICHARD BANNISTER, F.I.C., formerly of the Inland Revenue Laboratory, said that it would be impossible to bring cream to London without the use of a preservative unless it were sold at once. He did not think that refrigeration was practicable.

Professor LLOYD agreed in this.

Mr. C. A. GATES, chairman of the Cream Trade Association and of the West Surrey Dairy Company, said his firm first supplied cream with preservative added 22 years ago. They used 0·75 per cent. for many years without any complaints. When the Departmental Committee reported that only 17½ grains should be used they reduced their amount, but finding that cream would not keep long enough with that quantity they again increased it to 35 grains. The exigencies of the trade required that potted cream should keep sweet for six or seven days. The boric acid was added to the cream immediately after separation.

Mr. JOHN ALLSOPP, manager of Edwards's Creamery at Winslow, Bucks, said they received milk twice a day from 80 to 100 farmers. On arrival it was filtered and separated and the cream which resulted was pasteurised and then the boric acid was added. With milk arriving at 8 A.M. the cream should be in London by 4 P.M. It was put in a cold room at their London depôt till next morning. Cream was now used much more than formerly for culinary purposes; probably about three-fourths of the cream sold was so used. 35 grains of boric acid was necessary, in his opinion. He used a special powder and added eight ounces to 17 gallons. It was put to him that this amount did not give 35 grains of boric acid to the pound but only 21 grains, which coincided with the amount found in the sample. Witness did not know but did not consider it was enough.

Mr. REGINALD BUTLER, managing director of the Wilts United Dairies, and Mr. E. D. MARDEN, director of Aplin and Barrett and the Western Counties Creamery, Limited, considered that 35 grains of boric acid was necessary in order to allow for the time in transit from creamery to customer.

Mr. BOUSFIELD, K.C., at the close of the evidence, said this was a trade created within the last 25 years in preserved cream, not fresh cream; it was only rendered possible by the use of preservatives and all the evidence went to show that boric acid was the least harmful of all preservatives. What had to be decided was whether this article containing from 21 to 22 grains of boric acid to the pound was injurious to the health of normal persons in normal quantities. The evidence of the appellant's witnesses was that it was not injurious to health in the quantity used.

Mr. MCCALL, K.C., for the respondents, said the Sale of Food and Drugs Act was intended to protect the community as a whole and not a particular class. Did the facts of this case bring it within the Act? He did not rely entirely on the witnesses for the respondents. Dr. Thresh, a witness for the appellant, had admitted that boric acid would be likely to be injurious to people suffering from kidney disorders, consumption, and indigestion, and that in some instances it was a slow poison. He thought the trade could easily meet the difficulty by more frequent delivery and by making more use of other methods, such as cold storage.

[1] See paper in THE LANCET, Sept. 22nd, 1906.

The CHAIRMAN, in giving judgment, said: In this case the appellant was convicted before the learned police magistrate under Section 3 of the Food and Drugs Act as selling an article of food mixed, to put it shortly, so as to be injurious to health, and from that decision he has appealed to this court. Now, first some discussion has arisen in regard to the meaning of the Act itself, Section 3, and we have considered who the class of persons are whose health might, or may be, injured by the article of food so sold. In our opinion the persons included are first what we may call normal persons and not an invalid in the ordinary sense—that though this article thus mixed would be unprejudicial to the health of the general community, even when it might be prejudicial to persons afflicted with particular diseases, we do not think that it would come within the terms of the section; on the other hand, we do think and for this reason because of certain findings of fact which I am about to go into, we do think that it includes cases of children and infants, and we think so because we think that now cream has become part of the food used by infants more than formerly. As a question of fact we find that this section only, of course, applies to foods and to the classes who use those foods, and if cream was not ordinarily used by infants then this section would have no application, but as we think that now infants do use cream mixed with their milk we think that this section applies to infants as well, and I may say in regard to that that if there is any desire expressed as to the ground on which we include infants in the classes we will state a case to anyone who is dissatisfied with our finding in respect to this matter. The finding of fact remains of course. We find as a fact that cream is now an article of diet used by the class to whom we referred—the class of children—as an article of food. We are of opinion in regard to this matter that cream if mixed with boric acid equivalent to that found in this case is as regards grown men and women uninjurious, but we are of opinion that it is injurious to the health of children and invalids. I need not refer to the class of invalids as for the reason given we do not think that they are referred to in the section, and holding that view that it is injurious to children—to infants and children—and that infants and children are a class to whom this section can be taken as those by whom this food is used and to whom this section applies, we hold in these circumstances that the conviction must be affirmed and the appeal dismissed with costs.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 76 of the largest English towns 9608 births and 5254 deaths were registered during the week ending Jan. 4th. The annual rate of mortality in these towns, which had averaged 16·8 and 14·7 per 1000 in the two preceding weeks, rose again to 16·9 in the week under notice. During the 13 weeks of last quarter the death-rate in these towns averaged 15·5 per 1000, the rate during the same period being 14·9 in London. The lowest annual death-rates in the 76 towns last week were 6·1 in Handsworth, 8·7 in Walthamstow, 9·0 in Hornsey, and 9·1 in Tottenham; the rates in the other towns ranged upwards to 24·2 in Wallasey, 24·3 in Rhondda, and 26·4 in Newport (Mon.). The 5254 deaths registered in the 76 towns during the week under notice showed an increase of 727 upon the number in the previous week, partly due to delay of registration during Christmas week, and included 393 which were referred to the principal epidemic diseases, against 398 and 372 in the last two weeks of 1907; of these 393 deaths 103 resulted from measles, 92 from whooping-cough, 75 from diphtheria, 49 from scarlet fever, 48 from diarrhœa, 26 from "fever" (principally enteric), but not one from small-pox. The deaths from these epidemic diseases in the 76 towns were equal to an annual rate of 1·3 per 1000, the rate from the same diseases in London being 1·2. No death from any of these epidemic diseases was registered last week in 11 of the smaller towns, including Norwich, Bournemouth, Bury, Rotherham, Plymouth, and Devonport; the annual death-rate from these diseases ranged upwards in the other towns to 3·4 per 1000 in Merthyr Tydfil, 3·5 in Ipswich, 3·9 in Rhondda, and 5·7 in Tynemouth. The fatal cases of measles, which had been 124 and 104 in the two preceding weeks, declined to 103 last week, but caused annual death-rates ranging upwards to 2·0 per 1000 in Stockton, 2·8 in Ipswich, 3·0 in York, and 5·7 in Tynemouth. The deaths from whooping-cough, which had been 94 and 89 in the two preceding weeks, rose again to 92 in the week under notice, the highest death-rates from this disease being 1·2 in Wigan, 1·4 in Newport and in Merthyr Tydfil, and 1·5 in Smethwick. The 75 deaths attributed to diphtheria showed a further increase upon the numbers returned in the three preceding weeks, which were 57, 62, and 71; this disease caused seven deaths in East and West Ham, three in Nottingham, six in Liverpool, five in Manchester and Salford, and two in Rhondda. The 49 fatal cases of scarlet fever exceeded the number in the previous week by eight and caused the highest death-rate, 1·5 per 1000, in Wallasey; 17 deaths from the disease were registered in London and five in Liverpool. The 48 deaths from diarrhœa all but corresponded with the numbers in recent weeks. The deaths referred to "fever" (principally enteric) were 26 in the week under notice, against 28, 20, and 23 in the three preceding weeks; the annual death-rate from this disease was equal to 1·2 per 1000 in Rhondda and 1·4 in Merthyr Tydfil. The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals was 4684 on Jan. 4th, against numbers declining from 5581 to 4999 at the end of the four preceding weeks; 440 new cases were admitted to these hospitals during last week, against 447 and 353 in the two preceding weeks. The deaths in London referred to pneumonia and other diseases of the respiratory organs, which had been 347 and 317 in the two previous weeks, were 333 last week and were 159 below the corrected average number in the corresponding periods of the five years 1903–07. The causes of 56, or 1·1 per cent., of the deaths registered in the 76 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in London, Leeds, Bristol, West Ham, Hull, and in 45 of the other towns; 12 uncertified causes of death were, however, registered in Liverpool, nine in Birmingham, and five of the 47 deaths in South Shields.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had been equal to 20·0, 20·8, and 18·2 per 1000 in the last three weeks of 1907, rose again to 20·6 during the week ending Jan. 4th, and was 3·7 above the mean rate in the 76 large English towns during the same week. Among the eight Scotch towns the death-rates last week ranged from 17·3 and 17·7 per 1000 in Aberdeen and Edinburgh to 24·8 in Dundee and 30·5 in Greenock. The 725 deaths in these eight towns last week showed an increase of 93 upon those registered during Christmas week, and included 127 which were referred to the principal epidemic diseases, against 116 and 109 in the two previous weeks; of these, 65 resulted from measles, 23 from whooping-cough, 15 from diarrhœa, 11 from diphtheria, seven from scarlet fever, five from "fever," and one from small-pox. These 127 deaths were equal to an annual rate of 3·6 per 1000, which was no less than 2·3 above the mean rate from the same diseases last week in the 76 English towns. The fatal cases of measles in these Scotch towns, which had been 53 in each of the two previous weeks, rose last week to 65, of which 47 occurred in Glasgow, six both in Aberdeen and in Greenock, three in Dundee, and two in Paisley. The 23 deaths from whooping-cough showed a slight decline from recent weekly numbers; ten occurred in Glasgow, four in Dundee, and three in Leith and in Perth. The 15 deaths attributed to diarrhœa included six in Glasgow and five in Dundee. Of the 11 fatal cases of diphtheria, five occurred in Glasgow and three in Paisley. Five of the seven deaths from scarlet fever were returned in Glasgow, as were all the five deaths referred to "fever," of which four were certified as enteric and one as cerebro-spinal meningitis. The fatal case of small-pox occurred in Leith. The deaths referred to diseases of the respiratory organs in these eight towns, which had been 158 and 127 in the two preceding weeks, were 128 in the week under notice, and were 55 below the number from the same diseases in the corresponding week of last year. The causes of 37, or 5·1 per cent., of the deaths in these towns last week were not certified or not stated; in the 76 English towns the proportion of uncertified deaths did not exceed 1·1 per cent.

HEALTH OF DUBLIN.

The annual rate of mortality in Dublin, which had been equal to 25·0 and 19·8 per 1000 in the two preceding weeks, rose to 25·5 in the week ending Jan. 4th. During the 13 weeks of last quarter the death-rate in the city averaged 21·5 per 1000, the rates during the same period being only 14·9 in London and 14·8 in Edinburgh. The 193 deaths of Dublin residents registered last week exceeded the number in Christmas week by 45, and included ten which were referred to the principal epidemic diseases, against ten and five in the two preceding weeks; of these, six resulted from whooping-cough, three from diarrhœa, one from diphtheria, but not one from small-pox, measles, scarlet fever, or

"fever." These ten deaths were equal to an annual rate of 1·3 per 1000, the death-rates from the same diseases last week being 1·2 in London and 1·0 in Edinburgh. The six deaths from whooping-cough in Dublin last week showed a considerable increase upon the numbers in recent weeks. The 193 deaths from all causes in Dublin included 39 of infants under one year of age and 59 of persons aged upwards of 60 years; the deaths of elderly persons showed a marked increase. Eight inquest cases and five deaths from violence were registered, and 61, or 31·6 per cent., of the deaths occurred in public institutions. The causes of four, or 2·2 per cent., of the deaths in Dublin last week were not certified; in London the causes of all the 1526 deaths were duly certified, while in Edinburgh the proportion of uncertified causes of death was equal to 8·5 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Deputy Inspector-General F. J. Lilly to Plymouth Hospital. Fleet Surgeons: J. Moore to the *Indus;* G. H. Foott to the *President*, additional, for three months' course at West London Hospital. Staff Surgeon J. C. Durston to the *Blenheim*.

ROYAL ARMY MEDICAL CORPS.

Lieutenant Arthur S. Arthur to be Captain (dated Oct. 1st, 1907). Captain Horace H. Kiddle, from the Indian Medical Service, to be Captain vice William H. Odlum, who exchanges (dated Dec. 18th, 1907). Lieutenant H. T. Treves, Lieutenant W. R. O'Farrell, and Lieutenant T. F. Lumb have been appointed to the London district from Jan. 1st.

ROYAL ARMY MEDICAL CORPS IN INDIA.

The following tour-expired officers have proceeded to England:—Major R. C. Lewis, Captain J. E. Hodgson, and Captain W. S. Crosthwait, on the hospital ship *Plassy*, from Bombay, on Nov. 1st, 1907. Lieutenant-Colonel W. Turner, Captain L. W. Harrison, and Captain H. Rogers, on transport *Rewa*, from Karachi, on Nov. 16th, 1907. Lieutenant-Colonel D. F. Franklin, Captain L. L. G. Thorpe, and Captain F. E. Rowan-Robinson, on transport *Assaye*, from Bombay, on Dec. 6th, 1907.

Lieutenant-Colonel A. S. Rose, on return to India from leave on medical certificate in England, has been posted to the 8th (Lucknow) Division. Lieutenant-Colonel W. T. Swan, on transfer from 3rd (Lahore) Division to 7th (Meerut) Division, has been posted to the Station Hospital, Meerut, for duty. Major E. M. Morphew has been transferred from Kailaina to command the Station Hospital at Delhi. Captain A. C. Osburn and Lieutenant J. P. Lynch have been transferred from the 7th (Meerut) Division to Burma Division on duty. Lieutenant F. Scatchard has been transferred from Agra to command the Station Hospital at Fategarh. On the arrival at Shahjahanpur of Captain Crisp from England for a tour of duty in India Lieutenant M. Keane has been posted to the Station Hospital, Meerut, for duty. Captain E. Blake Knox, has been appointed staff officer Medical Mobilisation Stores 7th (Meerut) Division.

INDIAN MEDICAL SERVICE.

Brigade Surgeon-Lieutenant-Colonel David D. Cunningham, C.I.E., retired pay, Honorary Physician to the King, is granted the honorary rank of Colonel (dated Dec. 4th, 1907).

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major Walter C. James to be Surgeon-Lieutenant-Colonel (dated Dec. 10th, 1907). Surgeon-Captain Arthur D. Ducat to be Surgeon-Major (dated Dec. 25th, 1907).

IMPERIAL YEOMANRY.

Royal 1st Devon: Surgeon-Lieutenant F. E. Little resigns his commission (dated Dec. 6th, 1907).

VOLUNTEER CORPS.

Royal Garrison Artillery (Volunteers): 1st Berwickshire: Surgeon-Lieutenant W. D. Forsyth resigns his commission (dated Nov. 26th, 1907). 1st Midlothian: Surgeon-Lieutenant W. G. Porter resigns his commission (dated Nov. 26th, 1907). William Guthrie Porter (late Surgeon-Lieutenant) to be Second Lieutenant (dated Nov. 26th, 1907). 1st Newcastle-on-Tyne: Surgeon-Lieutenant-Colonel A. T. Wear resigns his commission, with permission to retain his rank and to wear the prescribed uniform (dated Nov. 7th, 1907). *Royal Engineers (Volunteers):* East London (Tower Hamlets): Surgeon-Lieutenant M. P. M. Collier to be Surgeon-Captain (dated Nov. 16th, 1907).

Rifle: 1st Volunteer Battalion, The Lancashire Fusiliers: Supernumerary Surgeon-Captain A. P. Nuttall to be Surgeon-Major, remaining supernumerary (dated Nov. 29th, 1907). 5th Volunteer Battalion, The Cheshire Regiment: Surgeon-Major J. H. Hacking is granted the honorary rank of Surgeon-Lieutenant-Colonel (dated Dec. 7th, 1907). 4th Volunteer Battalion, The Cameronians (Scottish Rifles): The undermentioned officer resigns his commission: Surgeon-Captain J. S. McKendrick (dated Nov. 2nd, 1907). 1st (City of Dundee) Volunteer Battalion, The Black Watch (Royal Highlanders): Supernumerary Surgeon-Lieutenant-Colonel D. Lennox is granted the honorary rank of Surgeon-Colonel (dated Dec. 5th, 1907). Surgeon-Captain J. S. Y. Rogers to be Surgeon-Major (dated Dec. 5th, 1907). 3rd (City of) London Volunteer Rifle Corps: Surgeon-Captain T. W. Parry resigns his commission (dated Dec. 3rd, 1907). 20th Middlesex (Artists') Volunteer Rifle Corps: Surgeon-Major H. D. Brook is granted the honorary rank of Surgeon-Lieutenant-Colonel (dated Dec. 3rd, 1907).

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

4th or City of London Bearer Company: Lieutenant J. Forbes to be Captain (dated Nov. 28th, 1907).

On Feb. 1st, at the headquarters of the Royal Army Medical Corps (Volunteers) (London companies), 51, Calthorpe-street, Gray's Inn-road, W.C., Lady Keogh will distribute the prizes won by the men and non-commissioned officers of the corps during the past year. The distribution of prizes will be followed by a dance.

ROYAL TERRITORIAL MEDICAL CORPS.

It has been decided that the medical arm of the Territorial Force shall be called the Royal Territorial Medical Corps.

THE ARMY MEDICAL STAFF.

Promotion to the higher ranks of the Army Medical Staff will be accelerated this year owing to six surgeon-generals being retired under the age rules—viz., Surgeon-General A. S. Reid, C.B., Surgeon-General W. J. Fawcett, C.B., Surgeon-General W. J. Charlton, Surgeon-General J. D. Edge, C.B., Surgeon-General R. H. Quill, and Surgeon-General W. B. Slaughter.

THE CONVALESCENT HOME FOR OFFICERS AT OSBORNE.

The King has approved the appointment of the undermentioned to the consulting staff of the convalescent home for officers of his Majesty's Navy and Army, Osborne, Isle of Wight, as from Dec. 8th, 1907: Sir T. Clifford Allbutt, F.R.S.; Sir William H. Bennett; Lieutenant-Colonel Sir R. Havelock Charles; Mr. W. Watson Cheyne, F.R.S.; Dr. David Ferrier, F.R.S.; Dr. James F. Goodhart; and Mr. A. Pearce Gould.

THE VETERANS' RELIEF FUND.

From time to time efforts have been made to disturb the inertia of the public conscience with regard to those who, having fought for their country in times of war, are allowed to starve or to drift into the workhouse when their services are no longer required. There is now, we are glad to note, some hope that this state of things will be remedied. Lord Roberts has written a letter to the press in which, referring to the recent review of Indian Mutiny veterans in Hyde Park, he says: "I found, to my regret, that no small number of them had come up that morning from the workhouse, and at the end of the day had only the workhouse to look forward to for the remainder of their lives." Lord Roberts also calls attention to "the Veterans' Relief Fund the object of which is to collect a sufficiently large sum to insure every Crimean or Indian Mutiny veteran being released from the workhouse, and then to make him such a weekly allowance as will enable the old sailor or soldier to spend his remaining days in moderate comfort and respectability, or ensure some amelioration of his circumstances if, from age or infirmity, he is obliged to remain in the workhouse infirmary." The King has consented to become patron of the fund and has opened the list of subscribers with a donation of 1000 guineas. The vice-patrons are the Prince of Wales, the Duke of Connaught, and Prince Christian of Schleswig-Holstein, and the committee includes the names of a large number of influential persons of rank and wealth. Contributions may be sent either to the account of "The Veterans' Relief Fund,"

at Messrs. Cox and Co., Charing Cross, London, S.W.; Messrs. Henry S. King and Co., Pall Mall, London, S.W.; and Messrs. Grindlay and Co., Parliament-street, London, S.W.; or to the honorary secretary and treasurer, Colonel Hurlock Pritchard, C.S.I., Eaglesfield, Camberley, Surrey; or to Lord Roberts, at Englemere, Ascot. Although the letter of Lord Roberts makes special reference to the veterans of the Crimea and Indian Mutiny we hope that the Fund may have eventually a wider scope and include within its beneficent ministrations any deserving man who, having fought in his country's cause, has fallen upon evil days.

RATS AND GUINEA-PIGS AS "PLAGUE BAROMETERS."

Writing in the *Indian Medical Gazette* for December, 1907, Captain R. O. Saigol, I.M.S., strongly recommends the keeping of rats and guinea-pigs to act, firstly, as "plague barometers"; secondly, as flea catchers and retainers; and thirdly, as locality indicators. Starting with the postulate that rat extermination is impossible in India, Captain Saigol proceeds to condemn all schemes for the control of plague that aim at destruction of the rodents. If plague, to which they are so obnoxious, cannot kill them off, he says, or even seriously diminish their numbers, nothing that we can do will have much effect. Among the schemes which Captain Saigol regards as abortive he includes cat keeping, which of late has had numerous supporters, but as we understand the matter multiplication of cats has not been advocated with a view to the extermination of flea-harbouring rats but in order that they may be driven out of human habitations by their natural enemies. Captain Saigol's recommendation is "that each household should be induced to keep guinea-pigs or three or more cages (according to the size and number of rooms) containing at least three rats in each cage," and if the measure could be enforced perhaps some of the results which he anticipates might be obtained. It is, however, practically certain that the effective maintenance of rats could not be enforced. The people who often find it hard to feed themselves could not be expected to feed and to maintain a considerable number of loathsome creatures. A cat which can forage for itself, partially so at all events, and is, moreover, more or less attractive, would probably prove acceptable to the population in general, but the wasting of good food upon voracious rats would most certainly be objected to. Captain Saigol's idea, if unpractical, is decidedly ingenious. Caged rats, if fully accessible, would probably "act as flea catchers and retainers"; and if one of the captive rats should die from plague its death ought unquestionably to serve as a warning to the household. As we have said, however, we see no reason for hope that the scheme could ever obtain recognition as a practical plague preventive.

HYGIENE AND SANITATION.

A new Army Order directs that general officers commanding-in-chief shall arrange for at least one annual course of lectures in sanitation for officers. The lectures will be given at the headquarters of the command by the command sanitary officer and at other stations by selected officers of the Royal Army Medical Corps quartered at those stations. All officers who can be spared shall attend the lectures at their own stations. A manual of sanitation has been prepared and has been issued to all concerned and instructions and examinations will be primarily based upon this manual. An examination in sanitation based upon the official manual will be included after March 31st next in the final examinations of cadets in the senior division. In Plymouth Coast Defence Orders on Jan. 3rd it was announced that the second senior course of lectures on hygiene and sanitation will consist of six lectures, the subjects being "Food," "Water," "Air," "Clothing and Alcohol," "Barrack Sanitation," and "Field Sanitation and Diseases of Troops on Service."

ROYAL PORTSMOUTH HOSPITAL.—It is proposed to continue the new buildings of the Royal Portsmouth Hospital by the addition of a new block for children's wards. At a court of governors held on Jan. 3rd, Mr. T. A. Bramsdon, M.P., in the chair, a tender for £5320 was accepted. There will be some extras to provide and the furnishing to follow. The total cost will be about £6000. To meet this a sum of £5000 has been raised.

Correspondence.

"Audi alteram partem."

PLEURAL EFFUSION AND ITS TREATMENT.

To the Editor of THE LANCET.

SIR,—Sir James Barr is not quite right in saying that I "strongly object to the phrase 'traction on the thoracic walls.'" I merely suggested that it might be preferable to speak of the lungs as exercising "suction" on the circumjacent parts. I do, however, demur to Sir James Barr's use of the term "elasticity" in his Bradshaw lecture. While it is not my intention "to attempt to improve the English language in giving a definite and limited meaning to each word," I would point out that in the science of physics the term "elasticity" possesses a definite as well as limited meaning, and that in discussing a question of physics it is needful to employ this term in the sense in which physicists employ it. This Sir James Barr has not done. The "elasticity" of the lungs does not, as Sir James Barr assumes, rise and fall as these organs expand and contract in respiration, but remains the same. What does rise and fall under these conditions is the pull which the lungs exert on the visceral pleuræ.

I should not, however, have called attention to Sir James Barr's ambiguous employment of this term—few writers are guiltless of ambiguity—were it not that he assumes, or appears to assume, that the suction, or let us say traction, which the lungs exert on the circumjacent parts is necessarily bound up with their elasticity. Such, as I pointed out in my letter, is not the case. This traction is in direct proportion to the degree to which the lungs are rendered taut—for the more taut the pulmonary tissue the greater is the tug exerted on the visceral pleura—but comparatively non-elastic lungs, such as those seamed with scar tissue, are capable of being rendered more taut, and thus of exerting more traction on circumjacent parts, than normal, highly elastic lungs.

In illustration of this proposition I cited the case of fibroid phthisis. I assumed the non-adherence of the pleura simply for the convenience of being able to refer to intrapleural pressure. Otherwise my purpose is equally well served by taking an actual case in which the pleuræ are adherent. In such a case the traction which the lungs exert on surrounding structures is considerably in excess of the normal, and this excess is due partly to the contraction of the scar tissue but still more to the preponderating action of the inspiratory muscles. Sir James Barr says: "In cases of fibroid lung there are no powerfully acting inspiratory muscles; any dyspnœa is represented by quick, short, and shallow inspirations; the pleuræ are adherent; any stretching of the lungs is caused by the pressure of the air within them and they are no more pulled out by 'powerfully acting inspiratory muscles' than the 56 pounds weight in my experiment is pulled up by the bookshelf and vaseline." I submit that this passage contains two false propositions.

1. *In fibroid phthisis the inspiratory muscles do not act powerfully.*—I assert from personal observation that they do. It is, moreover, possible to prove deductively that they do; in many cases of fibroid phthisis the mean size of the thorax is increased, and this in spite of the fact that the lungs are less than normally yielding to a stretching force. How could such an increase be effected but by a supernormal activity of the inspiratory muscles?

2. *The stretching of the lungs is caused by the pressure of air within them.*—What, I would ask, has the average intrapulmonary air pressure got to do with the stretching of the lungs when the pleuræ are adherent? Manifestly nothing whatever. It is true that in the case of non-adherent pleuræ the lungs would not be stretched with the inspiratory expansion of the chest without the push of the intrapulmonary air pressure, but such inspiratory stretching cannot be said to be brought about by this internal push; this latter is counterbalanced by the external push exerted by the extracorporeal atmosphere. Clearly, then, the force which stretches the lungs is provided by the inspiratory muscles. Take a piece of cord (= lung), let it be attached to a ring in the wall (= root of lung), let the other end of the cord be attached to a ring fixed to a small smooth steel plate (= visceral pleura), let the plate be fixed by means

of Sir James Barr's vaseline method to a moveable board (= parietal pleura). Now gradually move the board so as to put the cord on the stretch (= action of the inspiratory muscles). Query, What stretches the cord? Is it the pressure of the atmosphere on the exposed surface of the steel plate?

In certain lectures published by me I refer, among other things, to the effect of pulmonary suction in drawing blood into the heart. Sir James Barr says that in so doing I merely elaborate, or attempt to elaborate, the work of others, and suggests that I did not know of this work, seeing that in my preface I say, "I am led to publish these lectures because in them are set forth for the first time certain principles which I believe to be important." Evidently Sir James Barr does not think I say anything very new in those lectures, and I am glad to know this because they have hitherto passed uncriticised. I would like to point out, however, that they do not deal only with the subject of pulmonary suction. I may, or may not, have cast new light on this subject, but that for which I chiefly claim originality in these lectures—and I am grateful to Sir James Barr for the opportunity he has afforded me of drawing attention to the fact—is in the enunciation of the principle that in practically all cases of dyspnœa other than those due to obstruction in the larger air-passages (as by strangulation or diphtheric membrane) the mean size of the chest tends to be increased by the preponderating action of the inspiratory muscles, and that this increase is of a compensatory nature. The truth of this generalisation does not appear to have been recognised. Evidently Sir James Barr, although he has apparently done me the honour of reading my lectures, does not recognise it, for otherwise he would not contest my statement that in fibroid phthisis the inspiratory muscles act with supernormal vigour, and that, largely in consequence of this, the comparatively non-elastic lungs are made to exercise supernormal traction on the circum-pulmonary structures.

I am, Sir, yours faithfully,

Clmiez, Dec. 29th, 1907. HARRY CAMPBELL.

ACUTE PULMONARY ŒDEMA.

To the Editor of THE LANCET.

SIR,—Having read the letters that have lately appeared in THE LANCET on Acute Pulmonary Œdema, the following case may be of some interest to some of your readers.

The patient, a man aged 30 years, was admitted on Dec. 20th, 1907, to the Taunton and Somerset Hospital complaining of shortness of breath and pain in the umbilicus. Up to 6.45 P.M. he was in his usual health and was driving into town with some friends. Having a slow horse, "he had to shout at it." About half an hour after starting he was "taken with the wind and pain in the navel," thought by him to be flatulence. His friends drove the rest of the way and at 8 P.M. left him at a hotel as he did not feel well enough to go with them to the theatre. At 8 55 P.M. he came by himself to the hospital in a cab. When admitted his face was pale and with an anxious look; his lips were cyanosed, his extremities cold; pulse rapid and of small volume. There was a slight odour of alcohol in the breath. He refused to lie down on the stretcher but preferred to be carried to the ward sitting in a chair. He was expectorating a good deal of frothy, "rusty" sputum by a muscular action that resembled a combined cough and vomit. He preferred to sit up in bed. He continued to cough up the frothy material in large quantities until his death (36 ounces in all). Venesection was performed, about ten ounces being extracted. Three veins were opened as the blood flowed very slowly. Oxygen inhalations, an injection of $\frac{1}{30}$th of a grain of sulphate of atropine and $\frac{1}{30}$th of a grain of strychnine were given, and hot fomentations, frequently changed, to the bases of the lungs behind. The man rallied slightly for a time but died 55 minutes after admission. He complained the whole time of dyspnœa and pain in the umbilicus. Nothing definite could be made out as to the condition of the heart owing to the loud stridor and bubbling râles. Dr. V. L. Ardagh of Stogumber, his previous medical attendant, informed me that he had had rheumatic fever 15 years previously and had never been able to follow any continuous employment owing to mitral valvular lesion. About three years ago the patient had a similar attack, was treated with carbonate of ammonia and squills and got better in a day or two. A coroner's post-mortem examination was made two days after death.

The lungs were intensely engorged and œdematous. The weight was 36 ounces each. The heart weighed 24 ounces; the right side of the heart was much dilated, the auricle being full of blood clot. The mitral valve showed evidence of stenosis and regurgitation, one cusp being the seat of a large calcareous mass. The left kidney showed two old infarcts. Except for some engorgement the rest of the organs showed nothing to throw any light on the cause of the condition. The following seem points of special interest:—1. The profuse bronchorrhœa. (The frothy material continued to come from the mouth and nose for several hours after death.) 2. The right heart and lungs were engorged but the veins of the extremities were empty and extremely hard to find even after bandaging the limb. When opened the blood flowed but slowly and clotted almost immediately, necessitating the opening of several veins. 3. The pain was referred to the umbilicus though nothing abdominal was found to account for it.

I am indebted to Dr. Brown, under whose care the case was admitted, for permission to publish the notes of the case.

I am, Sir, yours faithfully,

W. J. JAGO, M.R.C.S. Eng., L.R.C.P. Lond.,
Assistant House Surgeon.

Taunton and Somerset Hospital, Taunton, Jan. 3rd, 1908.

To the Editor of THE LANCET.

SIR,—Acute congestion or œdema of the lungs is a common cause of death so rapid and unexpected as to demand an inquest. I have met with several such cases—the last three weeks ago. A temperate man, aged 50 years, who had had good general health and had not consulted a medical man for a long period, was out for a considerable time during the evening of Dec. 19th—a cold, wet, stormy night. He did not complain of anything when he went to bed, but about 4 A.M. he roused one of his children, said he felt very ill, and told her to fetch some whisky from downstairs. Before she could return he was dead. On post-mortem examination I found both lungs universally loaded with blood and serum, the lower parts being almost airless. There were extensive old adhesions of the left pleura. The heart was of moderate size with competent valves, but the walls were thin and rather soft. The aorta showed commencing atheroma. Other organs were healthy.

In another case which I saw recently a man aged 60 years, who lived alone in a small flat and appeared to be in his usual health during the day, was heard to come home about midnight on a cold, wet night. Next morning he was found dead by the side of his bed which had not been used. He had just begun to undress. In another case a woman was shopping on a cold, foggy, winter's evening. Her breathing suddenly became distressed and she went into a shop and asked to rest but she died before assistance could be obtained. When I saw her a few minutes later there was a thick layer of white froth covering her mouth and nostrils, looking at first sight like a pad of cotton-wool. In all these cases the victim had been out at night in cold and damp weather, and in all the necropsy revealed lungs deeply gorged with blood and serum and a heart of unsatisfactory powers, though free from valvular defects. In each case the opinion was given that death was from syncope, a weak heart having failed owing to rapid congestion of the lungs due to exposure to cold and damp weather.

I am, Sir, yours faithfully,

FREDERICK POLLARD, M.D. Lond.,
Surgeon V Division, Metropolitan Police.

Jan. 6th, 1908.

ALCOHOLISM: ITS CAUSES AND TREATMENT.

To the Editor of THE LANCET.

SIR,—With most of Lieutenant-Colonel Douglas's letter in your issue of Dec. 28th I entirely agree, but when he makes the sweeping statement, "Drugs are useless," I feel compelled to give him my experience. That drugs are useful in inebriety any medical man can easily convince himself, especially if he has the practice of a police surgeon. There is nothing more remarkable in the whole round of medicinal treatment than the effect of apomorphine upon the mad-drunk patient. A small hypodermic injection of this drug will produce an immediate calm and in less than ten minutes a quiet sleep. No medical man who has once seen this can say that drugs are useless in the treatment of inebriety. I do

not maintain that apomorphine will cure an inebriate, but it is a very useful drug upon occasion. Lieutenant-Colonel Douglas admits that bromide is sometimes useful. In this I heartily agree with him. When a patient has been drinking freely and his system is thoroughly saturated with alcohol it is very good practice to keep him in bed for two or three days under the influence of huge doses of bromide. A drinking bout can be cut short in this way. But the most useful drug, the one which can be relied upon in the treatment of inebriety, is atropine. This should be administered by hypodermic injection with strychnine twice a day. In this way it is possible to treat inebriates successfully, both men and women, and that without the aid of any institution. They will give up their alcohol while living in houses where others take it and they will safely pass public-houses on their way to and fro for the treatment. Gradually their power of self-control becomes established and they become permanent abstainers. I have cases now of more than two years' standing who have been treated in this way. If Lieutenant-Colonel Douglas could spare a day to visit Nottingham I could bring case after case and prove to his satisfaction that the drug treatment for inebriety is a brilliant success. I am, Sir, yours faithfully,

Mansfield-road, Nottingham, Jan. 7th, 1908. JOS. S. BOLTON.

THE PERSONAL FACTOR IN DIET.

To the Editor of THE LANCET.

SIR,—While I desire to thank Dr. C. J. Macalister for his very kindly mention of my writings in his address[1] I should also like to make a few remarks on what he speaks of as my "mistake."

I do not deny that there is such a thing as idiosyncrasy, but to postulate it is to take refuge in the unknown. Further, I think that what Dr. Macalister includes under this heading is often a mere result of the relation of uric acid to its solvents in the blood stream. For those whose blood is in a condition to dissolve considerable quantities of uric acid are at once depressed by its administration and exhibit slow capillary circulation, headache, lethargy, and depression; while those whose blood is not a good solvent are stimulated by it, showing quick capillary circulation and well-being. This has, no doubt, often been taken for idiosyncrasy, but that it is not so is proved by the fact that both effects may be seen in the same individual under different conditions of season, climate, or general nutrition, sometimes merely at different times of day. I have injected considerable quantities of urate into the blood stream and yet found that the same blood drawn a few minutes later contained less than usual. What had happened here? The injected urate had been retained in the liver, spleen, &c. (Sir A. Garrod), and it had there acted as a uric acid filter and cleared the blood of the quantity usually present, just as lime added to a hard water precipitates all the lime it contains. Here the administration of uric acid acted as a stimulant and everything that clears the blood of uric acid does the same. On the other hand, if the blood is in a condition to dissolve uric acid freely an identical administration will act as a depressant and the blood will be found to contain more than usual. The result of a given dose is always dependent on the solvent powers of the blood; it is not a matter of idiosyncrasy but of chemistry. Hence the dyspeptic and debilitated with his blood highly alkaline is depressed by the same dose that acts as a tonic and stimulant to the strong and well nourished. Yet the strong and well nourished has not burnt up or destroyed his uric acid; he has merely retained it, as in the above-mentioned experiment, and it is all excreted later when solvents are available. Subject to the conditions that affect solubility the quantity of uric acid in the blood and its effect on the circulation can be controlled and demonstrated in anyone in two or three hours, but Dr. Macalister does not appear to have repeated even my more simple experiments on this subject. He freely acknowledges that a purin-free diet cures the cases I have described, yet he does not tell us how it acts, while the visible effects of uric acid on the circulation, which he appears to have overlooked, suffice to explain everything. Everyone has his circulation slowed by uric acid *when it is in his blood* and not merely retained in his liver or fibrous tissues.

[1] THE LANCET, Dec. 28th, 1907, p. 1807.

Oxygen which Dr. Macalister mentions is but another instance of the same thing, for the effect of oxidation (i.e., acid formation) is to diminish the alkalinity of the blood and so the solubility and excretion of uric acid. Conversely deficient oxidation increases the excretion of uric acid but this, like all excretion under solvents, gets less the longer the solvent is continued, i.e., as the stores in the glands and tissues are reduced. If it were formation it should continue at the same level in relation to urea—that is, to the general level of metabolism. Further, if the above-named diseases were due to excessive formation of uric acid no change of diet could relieve them. On p. 1808 he mentions the case of a man whose recipe for a long and happy life was "live on milk." It may be remembered that the late Professor Humphry found that the centenarians whose diet he investigated had mostly been in the habit of contenting themselves with very small quantities of flesh and alcohol. The flesh they left out was no doubt replaced by an increase of breadstuffs, milk, and cheese, so that there was no diminution of albumin or of carbohydrates. May we not conclude that Dr. Macalister's case was not idiosyncrasy, but one instance of a general rule?

Lastly, may I say that my thesis is not that uric acid is the cause of all disease, but that it is the cause of some; that it is the cause of some cases of headache, fits, depression, &c., when these are not due to obvious organic disease. Such troubles when due to uric acid are generally temporary or periodic and are relieved by a uric-acid-free diet.

I am, Sir, yours faithfully,

Brook-street, W., Dec. 30th, 1907. ALEXANDER HAIG.

HYPERTROPHIC STENOSIS OF THE PYLORUS.

To the Editor of THE LANCET.

SIR,—During the last year I have had two cases of this affection under my care and they make me doubt two statements I have recently read in medical journals. The first appeared in THE LANCET a few weeks ago and was to the effect that this affection is to be diagnosed from other infantile affections of the stomach by (amongst other signs) *palpating the enlarged pylorus*. The second statement appeared in the *Clinical Journal*, "as regards the severe cases in which lavage fails, the only recourse is to try operative relief." Both my cases were typical of hypertrophic stenosis. Born healthy, a few weeks after birth the "pumping" vomiting commenced, with rapid wasting, peristaltic waves passing from left to right across the epigastrium, the sunken lower and distended upper abdomen, constipation, and when the bowels did act small hard motions, and with all these hunger directly after the vomiting.

After trying almost every food advised for infants I operated on the first case, hoping that I might be able to dilate the pylorus by invaginating with my finger. The much enlarged and elongated pylorus was completely covered by the large infantile liver and demonstrated conclusively how impossible it would be to palpate a pylorus in such a position. It was as hard as cartilage and invagination was out of the question, so that I performed pyloroplasty as quickly as I could. The child unfortunately died about seven hours after the operation. The second child I did not expect to recover. He wasted to 3½ pounds and the parents longed for his death as he was "too awful to look at." On several occasions he was thought to be dead. No pylorus could be felt.

As a last resort all nourishment by the mouth was stopped and for a week or ten days only salt and water injections by the rectum were given and a "dummy" of cotton-wool dipped in water to moisten the lips. Of course, all vomiting ceased as a result of this. Nourishment by the mouth was resumed very gradually and the saline given less frequently. The child is now seven months old and from a photograph I have just received I should say he weighs between 12 and 14 pounds. In my opinion, stopping all food by the mouth enabled the spasm to subside and the hypertrophy with it. I should certainly give this treatment first place should I have a third case. Operation would have killed this child without any doubt. I must not omit to add that Dr. E. J. Cave gave me invaluable aid in the first case and Dr. F. C. Fosbery in the second.

One should not rush to conclusions from two cases only, but it would be interesting to hear what pathologists

attached to children's hospitals have to say about the position of the pylorus and liver in infants and the possibility of being able to palpate the hypertrophic pylorus.

I am, Sir, yours faithfully,

Bath, Dec. 31st, 1907. W. H. COOKE.

AMYL NITRITE IN HÆMOPTYSIS.

To the Editor of THE LANCET.

SIR,—In a lecture delivered at the Medical Graduates' College and Polyclinic and published in the *Clinical Journal* on Oct. 2nd last, and which has only just reached us in the Antipodes, Dr. Leonard Williams uttered a very decided opinion condemning the use of amyl nitrite in hæmoptysis due to pulmonary tuberculosis.

> If it is one of the pulmonary vessels proper which is ruptured, nitrite of amyl will do no good, because to induce a widespread systemic vaso-dilation will have no necessary or even probable effect upon the pressure of the vessels in the lungs. If the hæmorrhage be from one of the bronchial arteries, then the administration of nitrite of amyl, by withdrawing the blood from the bleeding point, may certainly serve to check the hæmorrhage. But we have to remember that it is possible to pay too high a price for this kind of styptic. The blood pressure in tuberculosis is already low, in advanced tuberculosis it may be dangerously low, so that if by administering nitrite of amyl we still further reduce it we are in danger of lowering it to the point at which the medulla is insufficiently supplied with blood and the patient dies. Before administering nitrite of amyl therefore we ought first of all to obtain some idea of the height of the blood pressure in the case we are treating, and if we decide to use the drug we should be careful to give no more of it than will serve to reduce the pressure to some point at which the medulla is still adequately supplied. ..... I prefer to have my cases treated on lines which do not demand such niceties.

A theory is useful when it helps to explain observed facts or when it leads to the discovery of new facts. Dr. Williams's theory does neither. In the case of hæmoptysis from pulmonary tuberculosis the fact is that amyl nitrite actually does check hæmoptysis. During the last three years I have treated at least 90 cases of hæmoptysis from pulmonary tuberculosis by the immediate administration of amyl nitrite. With few exceptions the remedy has been promptly effective. I have not known it to do harm, and it certainly has not caused the death of any of my patients. I have found it safer than morphia, for I have seen at least two cases of hæmoptysis in whom a fatal issue could reasonably be ascribed to the administration of morphia. The lung was flooded with blood and a form of pneumonia rapidly supervened.

Amyl nitrite can be used at the earliest possible moment by the patient himself before the arrival of the doctor. A patient who is subject to hæmoptysis must derive much comfort from the knowledge that he carries in his pocket a remedy which has once stood him in good stead, and that will probably be as effective again should he have occasion to make use of it. Dr. Williams's lecture is calculated to deprive some patients of a valuable remedy and of the peace of mind which its possession secures. I am sure he would rather modify his theory than commit such an error.

I am, Sir, yours faithfully,

C. REISSMANN, M.A., M.D. Cantab., B.Sc., M.R.C.P. Lond.

Adelaide, South Australia, Nov. 25th, 1907.

THE DRUCE CASE.

To the Editor of THE LANCET.

SIR,—As a constant reader of your valuable journal I was interested in your annotation this week *re* the exhumation of the body of Mr. T. C. Druce. When commenting on the suit tried before Mr. Justice Gorell Barnes you say, "there was an irregularity in the certificate of the cause of death in that it did not bear the signature of any medical man, the simple explanation being that in 1864 the law did not require death certificates to be signed."

In the year 1874 the Births and Deaths Registration Act was passed and came into force. In this measure it was enacted that the name and qualifications of the certifying practitioner should be entered in the space allotted to the cause of death in the death registration book, so that previous to the year 1874 such entry would not appear—I presume this is what you refer to in your annotation? I cannot comprehend what legal status a death certificate would possess without the signature of the practitioner granting it either before or after the passing of the said Registration Act. I commenced practice in 1871 and signatures were always required to the death certificate forms supplied under the old Act.

I am, Sir, yours faithfully,

EDWARD A. PIGGOTT, L.R.C.P. Edin., &c.

Clare, Suffolk, Jan. 4th, 1908.

THE NEEDS OF LONDON MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—In answer to the two correspondents in this week's issue of THE LANCET under the heading "The Needs of London Medical Students" I submit that the London Conjoint diplomate does undergo a course equal to that of the average university graduate. In support of this proposition I quote from the report of the committee of delegates appointed by the Royal Colleges in 1885 and signed by the late Sir William Jenner:—

> That the curriculum of study and the examinations to be undergone for the Licence of the Royal College of Physicians of London and the Diploma of the Royal College of Surgeons of England are equal to those required by most of the universities for degrees in medicine and surgery.

Having dealt with the course of study which takes the average London Conjoint student about seven years to complete, now I will deal with the successes of graduates and Conjoint diplomates respectively in the public service competitive examinations. Without going into all the statistics for the last 20 years, which are equally favourable to the London Conjoint diplomate, allow me to draw attention to those of 1907[1] and under the heading "Percentage rejected" will be found the following figures:—

	Percentage rejected.
English Conjoint diploma alone	4·1
English degree alone	20·0
Irish degree alone	21·8
Scottish degree alone	22·0

In the face of these statistics how can it be contended that the London diplomate is inferior to the graduate? One might say the opposite, and that the diplomate has superior professional attainments.

In conclusion, allow me to quote from Professor W. Osler's remarks recently uttered at St. Mary's Hospital: "Finally, he expressed regret that so many students passed examinations which were in all respects equal to those passed by provincial students but nevertheless did not thereby obtain the degree of M.D."; and also Sir W. H. Allchin who, as an examiner, affirms that "the stringency of university examinations is scarcely so real or the test so far-reaching as is commonly imagined, and that the examinations of the Conjoint Board are, taken as a whole, as satisfactory as any and more so than many."

I am, Sir, yours faithfully,

Acton Hill, W., Jan. 4th, 1908. F. W. COLLINGWOOD.

To the Editor of THE LANCET.

SIR,—There has been so much written from time to time under the above heading that it would seem almost useless to attempt to write anything fresh upon the subject in question; there is, however, something which I believe has been left unsaid, and that is my reason for sending you this. One of your correspondents actually goes so far as to state that the public prefers to go to a man who has the degree of M.D. That, I think, is quite a mistaken idea; 99 per cent. of the public don't care twopence whether their medical attendant has the degree or not, and probably would not know if they were asked; but what they do know, and what every one of them could tell you, would be what physician or surgeon they had the greatest faith in. The general practitioner who is most beloved by his patients and in whose opinion they place their faith is not always a man who has obtained the highest honours at college or hospital; he is rather one who by a careful study of his fellow men has been able to use such knowledge and skill as he may possess, when freshly registered, to the best advantage.

The best general practitioner I ever knew told me that the quickest way to get on in practice was to forget the old abrupt "hospital manner"; to forget the hundred and one theories and doubts of modern medicine; to remember the

[1] See Supplement of the Brit. Med. Jour., Nov. 30th, 1907.

cases you saw in the clinical wards, and to remember that your patients were human beings with "feelings," not objects merely for "interesting discussions"; and lastly, that no matter what your degrees might be it was essential to be above all things a gentleman. What was true then is true to-day. Any young fellow of average intelligence who has obtained a sound qualification and who does not imagine that his education has already finished, will by attention to his profession learn a great deal in from five to ten years from the date of his qualifying; indeed, he will be in a better position to treat successfully a case than the newly graduated Doctor of Medicine. The young M.D. in time will be just as good at his work, and the stage at which a practitioner becomes a really good man is fixed not by his position in the schools or his place in the examination lists, or by his degree or diploma, but after a few years of careful study and daily practice. So that, we may take it, all medical men who are any good at all will be about equal, so far as the actual knowledge of their calling is concerned, at some time or another. Then comes the great point of all: it is the man himself; and so far from craving for a title which many of us, very many of us, have never attempted to obtain, we rather pride ourselves that besides being physicians or surgeons we are also fellow men with our patients, and it is better to be a successful general practitioner with the plain title of Esq. than an unsuccessful one who can add M.D. after his name. When your correspondent says that Mr. Smith, M.R.C.S., is ashamed of his qualification and jealous of Dr. Jones, he must mean perhaps one man out of the many who, like myself, have not a university degree.

It is the man, not the degree, and never was it more important than at the present time for all of us to try to keep up the honour of our calling and to unite as one rather than have these petty disputes. We are all medical men, and the great aim of each and every one of us should be to prevent and to combat disease and help those who ask our aid; and, above all, let us try to behave as gentlemen, let there be less quarrelling and fewer complaints of our hardships and our wants. After all, we do not practise merely to make money, and if a new patient should prefer to call in Dr. Jones, well, Mr. Smith, M.R.C.S., may b able to have the next one, and perhaps Dr. Jones may not care for a day's shooting or hunting, and Mr. Smith not having to see the new patient at home may find several more on the hunting-field. Dr. or Mr., let us try to forget all this and behave anyhow as sportsmen and play the game.

I am, Sir, yours faithfully,

Suffolk, Jan. 4th, 1908. COUNTRY SURGEON.

THE LOCAL MEDICAL PROFESSION AND THE HAMPSTEAD GENERAL HOSPITAL.

To the Editor of THE LANCET.

SIR,—I am directed by the committee appointed to represent the local medical profession to ask you to insert a brief account of the steps which my committee has recently taken in regard to the Hampstead Hospital question.

As you are aware, the council of the hospital has decided, on the strength of a very narrow majority of subscribers, to accept the terms offered by the King Edward's Hospital Fund for London, which include the amalgamation of the North-West London and Hampstead General Hospitals and the appointment of a staff of consultants to the exclusion of the local practitioners.

In response to this decision of the hospital council my committee issued a circular on Dec. 12th, 1907, to the individual members of the local medical profession, asking for their approval of the following resolution which had been adopted at a meeting on July 3rd, 1907, namely:—

> That this meeting considers that the Hampstead Hospital should always have a visiting staff of local practitioners, and in consideration of this opinion calls upon the members of the medical profession to refuse to accept any office on the staff on terms which are not considered satisfactory by the local profession.[1]

Of 191 local practitioners receiving the circular no fewer than 132 (i.e., 68 per cent.) appended their signatures to the resolution, of whom 75 are members of the British Medical Association and 57 are not members. This result was so striking that my committee thereupon felt justified in inserting a warning notice in the *British Medical Journal* (since accepted by THE LANCET). Finally, on learning the opinion of such a large majority of their colleagues the members of the acting medical staff and the anæsthetists have tendered their resignations to the council of the hospital.

I am, Sir, yours faithfully,

REGINALD A. YELD, M.D. Cantab.,
Honorary Secretary of the Hampstead division of the British Medical Association and of the Joint Committee appointed to represent the local medical profession.

Jan. 8th, 1908.

[1] This resolution is not intended to preclude the appointment of consultants.

NOTES UPON HEALTH RESORTS: JAMAICA.

To the Editor of THE LANCET.

SIR,—As one who practised in Jamaica between 30 and 40 years I have been deeply interested in your Special Correspondent's letters on "Jamaica as a Health Resort." The letter dealing with the value of its medicinal springs is well worthy of particular attention, for none but those long resident in the island are aware of the great value to be derived from their use in chronic cases of certain diseases. It is much to be regretted that the accommodation, both at the Milk River and the St. Thomas Baths, is so unsuitable and inadequate. Your correspondent, however, apparently did not hear of a very remarkable medicinal spring at Windsor in the parish of St. Ann's, which 40 years ago attracted a great deal of attention and to which thousands of negroes flocked from all parts of the island. That the use of it effected many remarkable cures there can be no doubt, any more than that the too liberal and injudicious use of it caused many deaths. At that time I sent you a quantity of the water which you had analysed by Dr. Attfield and gave the results in a paragraph in THE LANCET of Dec. 21st, 1867, page 795, under the title of "A Remarkable Medicinal Spring." The spring I am now referring to is "the second spring discovered recently," and Dr. Attfield states that "it contains 2493½ grains of solid matter" to the gallon, and that "spring water containing such a large amount of solid matter has probably never been met with." The water contains 3½ ounces of chloride of calcium and 2 ounces of chloride of sodium in the gallon.

Chloride of calcium is at present much more used in medical practice than formerly, and I would suggest that someone interested in the matter might import some of the water and give it a fair trial. Probably some old negroes resident in the district could point out its exact locality, for in recent years it was not much resorted to. Perhaps, however, the recent earthquake has destroyed it or diverted its course.

I am, Sir, yours faithfully,

Dec. 29th, 1907. M.D. EDIN.

*** We publish with pleasure our correspondent's interesting letter, which we have submitted to our special commissioner who visited Jamaica recently. He had no information of such a noteworthy mineral spring in St. Ann's, and as there is no record of it in the Hon. J. Phillipo's monograph on "The Mineral Springs of Jamaica," which was published in 1891, he concludes that it has fallen into disuse. We are convinced of the great utility of the Jamaican springs in the treatment of disease, and when the accommodation provided for invalids who visit them has been improved they should prove a valuable means of attracting visitors to the island. Our correspondent's reference to our columns is correct.—ED. L.

THE MEDICAL DIRECTORY, 1908.

To the Editor of THE LANCET.

SIR,—The publishers of the Medical Directory are not likely to pay attention to an individual complaint. I should like to ask whether others do not find a great inconvenience in the system introduced this year in the "London Local List." All street names are discarded, and the names alone, without address, crammed alphabetically in a single paragraph. There is no Russell-square or Southampton-street. If a doctor near the Strand is wanted all those names under "Bloomsbury," between the Thames and King's Cross, must be looked up. So with "Camberwell," &c. For many purposes this makes the Directory useless, as I have found to-day, to the grave misfortune of a friend and myself. Moreover, we

have nothing else to turn to; if this feature continues I hope it will not be long before we have.

I am, Sir, yours faithfully,

Jan. 4th, 1908. F.R.C.P.

*** We cannot agree with our correspondent that "all street names have been discarded"; for instance, Welbeck-, Wimpole-, and Weymouth-streets are all given, while to Mansfield-street is appended "see Portland-place." We note, however, that the name of at least one practitioner in Mansfield-street is given under Cavendish-square. The new arrangement is by no means so convenient as the old.—ED. L.

MEDICAL MEN AND LEGISLATION.

To the Editor of THE LANCET.

SIR,—There have been several letters in THE LANCET during the past year pointing out how recent Acts of Parliament impose new duties on the medical profession whether they like it or not, in some cases under penalty, without making any provision for the remuneration of the members of the profession for the work they may be compelled to do. The profession seems to be unanimous in thinking that this is objectionable. If the tendency of recent legislation continues it is difficult to see where it will end or what will be the condition of the profession in a few years. Up to the present medical men seem to have only discovered the objections to various Acts of Parliament after they have been passed. It would surely be better to do this before the Acts have been passed. It is far easier to amend a Bill before Parliament than to remedy the defects of an Act which is already in force. To do this it is necessary that there should be a body of men capable of doing such work carefully to scrutinise every Bill brought before Parliament which may affect the medical profession. With the profession or even a majority of it behind them such a body of men could do a very great deal to safeguard the interests of the profession. The legal profession very successfully safeguards its interests in this way. It is surely time the medical profession awoke to the fact that unless it possesses some organisation for the purpose of watching legislation with a view to safeguarding its interests it will before long find that its interests have suffered seriously.

I am, Sir, yours faithfully,

Jan. 2nd, 1908. M.D.

A PROPOSED SHIPS' SURGEONS ASSOCIATION.

To the Editor of THE LANCET.

SIR,—Having observed in THE LANCET of August 25th last that a British Association for Ships' Surgeons has been formed in London with the object of establishing and improving the status of ships' surgeons, I take the liberty of suggesting that it would be an excellent thing for all fully qualified men holding certificates from one of the British universities if a similar institution were formed in the Far East, so that the position, prospects, and pay of medical officers on board ship might be recognised as being of equal value with those held by medical men ashore. At present shipowners and agents fail to grant the legitimate demands of those members of the profession who become ships' surgeons, wholly ignoring the labour and responsibility which attach to the office. Medical practitioners who elect to prove their abilities on board ship should, in my opinion, certainly form themselves into an association to enforce their rights and secure at least public recognition. And there is no place where such an association would prove of greater influence than in the Far East, with Hong-Kong as the centre and headquarters.—I am, Sir, yours faithfully,

D. R. P., L.R.C.P., L.R.C.S., L.M.

Hong-Kong, Nov. 19th, 1907.

PS.—Should brother practitioners agree with this suggestion they might communicate with me, care of the Editor of THE LANCET. D. R. P.

SOUTH DEVON AND EAST CORNWALL HOSPITAL.—During 1907 the Sunday schools in Plymouth and the district collected £60 in aid of the children's ward of the South Devon and East Cornwall Hospital.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

Christmas Festivities.

CHRISTMAS has passed in much the usual manner in the hospitals and public institutions in the city and district. Anticipation, brightness, enjoyment, and increased hope have prevailed everywhere and for a time at least the weary and pain-stricken have forgotten their troubles and have rejoiced in an exhilarating atmosphere which must have had a tonic effect. The decorations in the various institutions have been admirable and the entertainments provided were well and thoughtfully chosen and well carried out; naturally they have varied in different hospitals but in all they were successful and the pleasure so obviously enjoyed well repaid those who had worked so strenuously to make the annual festival so pleasant a time to those who were debarred from home pleasures. In the midst of the general rejoicing the cripples were not forgotten, for a crippled children's party and an adult cripples' party were held in the town hall. At the former party 500 cripples under the age of 16 years were entertained and at the latter 230 adults. The expenses in the case of the children were defrayed by Mr. Ansell and in the case of the adults by subscriptions collected by Miss E. L. Jones.

The Sanatorium for Consumptives.

The scheme which the health committee has devised for the utilisation of the Salterby Grange Estate, which was recently acquired by the city for the purpose of providing a sanatorium, seems in all respects admirable. The committee suggests that the existing house shall become the administrative block. It will provide quarters for the medical officer, matron, nurses, and servants, as well as an excellent dining-room and a recreation room. The present kitchen will need enlarging, but that is the only alteration of importance which will be required. For the accommodation and treatment of the 40 patients for whom it is proposed provision should at once be made the committee suggests that four blocks of brickwork chalets shall be erected, two blocks to contain 16 patients each and two for four patients each. The committee favours grouped rather than separate chalets on the grounds of easier and more efficient administration, diminished expense, and greater accessibility to the sanitary blocks, and it recommends brick rather than wooden buildings, because the former will not cost much more to erect in the first instance, will be more durable, less costly for maintenance, and equally sanitary; moreover, they can be erected by loan, whilst wooden buildings must be provided out of revenue. The chalets will face south and be protected by rising ground from the north and east winds. They will open on to a terrace on to which the beds can be wheeled directly out of the rooms. The patients' rooms will measure 12 feet by 10 feet. They will be provided with through ventilation and they will communicate by covered passages with the sanitary blocks. It is presumed that, as a rule, heating will be unnecessary in the chalets but small stoves will be provided for use in exceptional cases. The water-supply is provided for by an excellent well and it is proposed that the sewage shall be dealt with by means of a septic tank and a bacteria bed, the effluent being discharged on to the land.

The Milk-supply.

Since my last letter further details of the medical officer's report concerning the tuberculous infection of the city's milk-supply have become available and certain interesting details are disclosed. It appears, as previously stated, that 14 per cent. of the milk delivered at the railway stations contains tubercle germs and it may be said that about 10 per cent. of the whole supply is infected. In association with this infection it is pointed out that the tuberculous death-rate during 1906 was 1·62, and, further, it is shown that during the past five years 431 children under one year and 487 under five years died from tuberculous diseases, tuberculous meningitis and tuberculous diseases of the intestines being particularly numerous in children under five years. It is suggested that possibly the frequency of tuberculosis of the intestines in children is due to the milk-supply. This suggestion would have greater force if it could be shown that the children who die from tuberculous diseases were born and lived in houses which could be considered healthy, or at all events in which

other source of tuberculous infection was not present. It is clear, however, that this infection is present in the milk, and as it is quite certain that under given conditions it could be entirely eliminated and a source of possible infection removed, the health committee is quite justified in taking steps to deal effectively with the problem. It may be doubted, however, if tuberculous diseases will ever be conquered unless infected human beings are strictly segregated.

The Staffordshire Education Committee and the Medical Inspection of School Children.

The subcommittee appointed to report upon the medical inspection of school children recently presented its report to the education committee and after pointing out that the duty of providing for the medical inspection of school children had been laid upon the local education authority recommended that school medical officers should be appointed to devote the whole of their time to the work of medical inspection; that a minor subcommittee should be appointed to make recommendations as to the number of officers to be appointed and the salaries to be paid; and that, in order to establish the initial organisation of school medical inspection as soon as possible after Jan. 1st the minor subcommittee should be authorised to appoint a qualified person who shall act as senior officer. The recommendations met with vigorous opposition for various reasons but eventually the amendments directed against them were defeated and all the recommendations were fully approved.

Jan. 7th.

WALES AND WESTERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENTS.)

The Medical Inspection of School Children.

THE county council of Brecknock has appointed about 14 medical practitioners in different parts of the county to carry out the provisions of Section 13 of the Education (Administrative Provisions) Act, 1907. There is no county medical officer of health and the various schools in the county have been allocated to these 14 gentlemen, some of whom are the district medical officers of health. For the same purpose the education committee of the city of Hereford has appointed five general practitioners in the town. The fees to be paid to the latter are at the rate of 1*s.* for each examination, a sum which was agreed upon as satisfactory at a recently held meeting of the Hereford members of the Herefordshire Medical Association. The average number of births in Hereford is under 500 yearly. In the county of Hereford no decision has yet been come to as to how the Act shall be administered. The question was discussed by the education committee but was ultimately referred to the county council for decision. There is no county medical officer of health and some members of the council appear to favour the appointment of this officer and to place upon him the duties involved in the carrying out of the Act. At a meeting of the Herefordshire division of the British Medical Association held on Dec. 30th last it was unanimously resolved that the payment of the school medical officer should be at the rate of not less than £50 per annum for an attendance of one-half a school day a week, one-half a school day being defined to be two hours, and that where practicable he should not be a practitioner interested in the practice of the district. The Gloucestershire county council has not come to any decision as to the administration of the Act and has adjourned the consideration of the matter until the next meeting of the council. There is no whole-time medical officer of health for Gloucestershire but Dr. J. Middleton Martin, who is the medical officer of health of several districts in the county, makes an annual report upon the whole county to the council and his services are also available for other purposes. At a meeting of the county council held on Jan. 6th certain proposals of a special committee were referred back for further consideration. These included the appointment of Dr. Martin at an annual salary of £470, permission being given to him to retain his district appointments. It was further proposed to engage two or three assistants who, with Dr. Martin, would undertake the medical inspection of the school children throughout the county. The estimated cost during the first year of this scheme was £1370, though it was anticipated that that amount would be increased in future years. There are 396 schools in the administrative county of Gloucester attended by over 50,000 children and it is considered probable that the number of inspections during the present year will be about 12,000. The Somerset county council has decided to appoint a chief medical inspector of school children at a salary of £500 per annum in addition to his travelling and other expenses. The officer appointed will be required to devote his whole time to his duties. This decision was not come to unanimously; 40 members of the council voted in its favour and 30 were opposed to it. The Merthyr Tydfil education authority, at a meeting held on Jan. 3rd, resolved to ascertain from the local members of the medical profession whether they would undertake the work of inspecting the school children, and if so, what fees would be charged, the suggestion being that there should be a fixed charge per head and that certain schools should be assigned to different medical inspectors.

Gift of a Motor Ambulance to Swansea.

A motor ambulance has lately been handed over to the Swansea corporation, the purchase money (£600) having been raised by private subscriptions. It is a 20 to 25 horse-power four-cylinder Panhard and the ambulance proper will accommodate four stretchers in two tiers. The uppermost can be folded to the sides of the ambulance when not in use, while any one of them can be placed upon a small hand ambulance upon rubber-tyred wheels, and this can be run into the motor ambulance along rails which can be folded up against the back of the carriage when out of use. The inside of the vehicle is lighted and warmed by electricity. A folding lavatory basin in connexion with which there is a supply of hot and cold water is provided, and there are cupboards which contain such appliances as are required for first aid. Mr. W. F. Brook is responsible for many of the details which have been very carefully and thoughtfully carried out. If arrangements are made for it to be available promptly this ambulance should prove of the greatest service in a district of the character of Swansea where the nature of the industries is such as to render the workpeople employed in them particularly liable to accidents.

Vaccination Fees.

At a meeting of the Launceston (Cornwall) board of guardians held on Dec. 28th, 1907, the subject of the fees of public vaccinators again came under discussion. The public vaccinators will not accept the minimum fee of 3*s.* 6*d.* and it was proposed that they should receive 5*s.* as previously. This, however, was defeated by a large majority of the guardians and it was eventually decided to refer the matter to the Local Government Board.

Jan. 7th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Edinburgh Royal Infirmary Board and the Late Surgeons.

AT the ordinary meeting of the board of managers of the Edinburgh Royal Infirmary held on Dec. 30th, 1907, it was resolved to insert in the minutes the following resolutions and to send copies to the relatives of the deceased:—

THE LATE SIR PATRICK HERON WATSON.

The managers of the Royal Infirmary have received with deep regret the announcement of the death of Sir Patrick Heron Watson. Although long since retired from the active work of the infirmary, Sir Patrick Watson was still a member of the staff as a consulting surgeon. Elected assistant surgeon in 1860, he became full surgeon in 1863, and so highly appreciated were his services in this capacity that on the expiry of his term of office in 1878 the managers appointed him an extra surgeon to the Royal Infirmary for a period of five years. The managers feel that work of such notable and outstanding character as that performed by Sir Patrick Heron Watson has contributed in no small measure to enhance the reputation of the Royal Infirmary; and in expressing their sorrow at his death, they desire to pay their grateful and respectful tribute to his memory.

THE LATE PROFESSOR ANNANDALE.

The managers of the Royal Infirmary desire to express their deep sense of the loss the institution has sustained by the death of Mr. Thomas Annandale, professor of clinical surgery, and the senior acting member of the surgical staff. Mr Annandale became connected with the Royal Infirmary as assistant surgeon in 1865; was promoted to be full surgeon in 1869; and has held the chair of clinical surgery since 1877, having charge of the wards assigned to this chair for the long period of 30 years. No medical officer of the Royal Infirmary has rendered it more devoted and loyal service than Mr. Annandale.

His eminence as a surgeon and clinical teacher was widely recognised, and during his long career his skill and experience were instrumental in relieving or removing an incalculable amount of human suffering. Mr. Annandale showed throughout a warm interest in all matters bearing upon the welfare and the usefulness of the Royal Infirmary, while his personal courtesy and kindly bearing to all with whom he came in contact had ever a happy influence in the institution. While lamenting his sudden removal, the managers feel assured that Mr. Annandale's memory will long be cherished as one among the distinguished men who have given of their best to the service of the Royal Infirmary.

Regret was expressed at the meeting on the retiral of Dr. C. E. Underhill, Dr. J. O. Affleck, and Professor C. Hunter Stewart from the board.

Forbes Dispensary, Inverness.

At the annual meeting of the managers of the Forbes Dispensary, Inverness, held on Dec. 31st, 1907, in the council chamber, the annual report by Dr. G. A. Lang, medical officer, was submitted. During the year ending Oct. 31st, 1907, 1637 patients were admitted. Of these 1335 were treated by the medical officer with the following results: Patients cured, 1076; relieved, 56; died, 9; sent to infirmary, 85; remaining under treatment, 46; infants vaccinated, 63—total, 1335; number of patients recommended for medicine by other medical practitioners, 302—total for year as above, 1637. The number admitted during 1906 was 1780, while since the establishment of the dispensary in 1832 up to date there had been admitted 83,312. There seemed to have been fewer cases of a serious nature than in former years. The report was adopted.

Cerebro-spinal Meningitis in Aberdeen.

The return of the medical officer of health for the last week of 1907 contains one case of cerebro-spinal meningitis. The case occurred in King-street, Aberdeen, and Dr. Matthew Hay reports that the case was verified bacteriologically.

Strange Story of a Needle.

The *Aberdeen Daily Free Press* reports the following curious story of the travels of a needle. Over 30 years ago an Aberdeen lady accidentally got a sewing needle knocked into her left foot, and owing to its having somehow shifted in the interval that elapsed before a medical man was in attendance it could not be removed. Time passed and the incident was forgotten. Early in the morning, however, a few days ago, the lady felt something always catching her dress at the right elbow and on looking at the cause was surprised to find the sharp end of a needle projecting from the flesh, and this her husband removed without much difficulty. The needle is about two inches in length.

Jan. 8th.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Tuberculosis Exhibition.

ON Monday last, Jan. 6th, the Lord Lieutenant and the Countess of Aberdeen paid a State visit to Portadown where they attended a public meeting at which Her Excellency the Countess of Aberdeen gave an address, the occasion being the opening in that place of the Tuberculosis Exhibition.

Unusually High Death-rate in Belfast.

At a meeting of the Belfast city council held on Jan. 1st it was reported that between Nov. 17th and Dec. 14th, 1907, 310 deaths occurred from chest diseases, 64 from pulmonary tuberculosis, 84 from pneumonia, and 162 from diseases of the respiratory organs exclusive of pneumonia. For the four weeks ended Dec. 14th Belfast also unfortunately possessed the highest death-rate of the five principal sanitary districts of Ireland. But since the meeting of the Health Commission in Belfast and the great awakening of the public with regard to the health matters of their city progress is being made by the health authorities, though an immense deal still remains to be done owing to the fact that Belfast had slipped behind the times. During the past year the infantile mortality has fallen to 134, as compared with 143 during 1906, and the death-rate from pulmonary tuberculosis has fallen from 3·5 per 1000 in 1905 and 2·7 in 1906 to 2·5 in 1907. That is to say, that Belfast in 1907 has reached a death-rate from pulmonary tuberculosis which was recorded in England generally 21 years ago. This is a consideration which the health authorities of Belfast and the inhabitants of the city must keep steadily before them when they feel inclined to allow their proper rejoicing in the improvement of sanitary affairs to get ahead of the facts.

School Accommodation in Belfast.

At a meeting of managers of the primary schools held on Jan. 2nd in the Municipal Technical Institute, Belfast, under the presidency of the Lord Mayor (the Earl of Shaftesbury), it was decided to approach by a deputation the Commissioners of National Education to ask for a liberal grant towards the improvement of primary school accommodation in Belfast. The Lord Mayor said that additional accommodation was required for something like 7000 children, and taking the estimated cost at £6 per head a sum of £42,000 was needed, which spread over three years would mean a sum of £14,000 per year. The primary schools in Belfast, from the point of view of architecture, overcrowding, and hygiene, are very much behind the times.

Jan. 7th.

ITALY.

(FROM OUR OWN CORRESPONDENT.)

The Hygiene of Pilgrimages.

MOST characteristic of all peregrinations of the religious devotee is the annual pilgrimage to Loreto in the Adriatic province of Piceno. At Christmastide in 1294—so runs the legend—the modest abode of the Nazarene carpenter Joseph was transported miraculously from Palestine to Italy where it was actually seen in a beatific vision by the reigning Pontiff to be deposited from the hands of the angels who bore it in a laurel grove near Recanati. Nay, a century before St. Francis had foretold the transfer of the house with the prophetic word "Picænum," which the Church thereafter interpreted as containing the initial letters of the phrase—

"Portatur Iuxta Concrum Ædicula
Nazarena Uirginis Mariæ."

(The Nazarene house of the Virgin Mary is carried to the neighbourhood of Concro.)

Thus attested by a Pope and a saint the house became naturally the resort of the faithful who year by year flocked to it in thousands to receive the blessing of the priest in charge and to carry away whatever hallowing association they could extract from the structure and its appurtenances. The Christmastide of 1907 witnessed no falling off in the numbers of those devotees—nay, the crowd was so great that, in the words of a correspondent who was present, the interior of the house, in point of ventilation, was little better than the Black Hole of Calcutta. Packed within a few square yards of space, under a roof so low that it might be touched by the hand of any moderate-sized person, in a darkness made visible by a sparing assortment of candles and lamps, still further exhausting the already vitiated air, the pilgrims were seen to kiss the humid walls, to lick the dust of the floor, to carry what they could of it to their lips, even to scrape the damp mould from any object near them and to press it to their mouths. And all this, continues my correspondent, at a time when the Board of Public Hygiene is doing its utmost to inform the people as to the risks which they run from contaminated air, from the "septic touch," and from the pathogenic microbes always abundant in crowds not given to personal cleanliness and often bringing from the insanitary tenements in which they huddle the germs of disease inherited or acquired! An appeal is already being made to the Administration of the Sanctuary (as the officiating custodians of the house are called) to ventilate the interior, to disinfect the damp, viscous walls, and to bring the whole edifice under the influence of sanitary law. This appeal (to which the said "Amministrazione" cannot surely be deaf) is strengthened by the citation of instances where in much more spacious resorts—even in cathedrals or basilicas—infective diseases are often contracted, to say nothing of the holy water sparingly renewed and dabbed overthe faces of the devout till ailments, often of a loathsome kind, are courted and incurred from it.

Death of Professor Biagi.

New Year's day witnessed the death in the Policlinico in Rome of Dr. Nello Biagi, professor of surgical pathology and pædiatry in the Istituto di Studi Superiori of Florence and surgeon-in-chief of the Mayer Hospital in the same city. On a visit to Rome of but a few days' duration and while

enjoying the society of old friends and colleagues associated with him in the clinique of the Senator Dr. Durante, of whom he had been the chief assistant, he "caught a chill" and succumbed to the sequelæ in spite of every care of physician and nurse. Professor Biagi was but 32 years of age and had obtained the post which he held in the Florentine Institute after a competition in which his scientific knowledge and practical skill made him the easy winner. His mortal remains were transported to the railway station, followed by all the more distinguished of the profession in Rome, whence they were carried by train to Florence for interment in the family vault.

Jan 4th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Perforation of the Pulmonary Artery by a Migrating Needle.

AT a coroner's inquiry, which also included a post-mortem examination of the body, held recently in Vienna, some remarkable facts became known. A labourer, aged 43 years, was found dead in his room, having ten minutes previously appeared to be in perfect health. In the subcutaneous fat of the abdominal walls there were found at the necropsy four pieces of needles, each about one inch long. Two of these were encapsulated in connective tissue and two were free. The pericardial sac was filled with liquid blood and on its anterior and posterior walls there was found a small penetrating slit-like opening. Two similar openings were found in the intrapericardial part of the pulmonary artery, just above the anterior and the right valve. These slits must have been caused by the migration of such needles as were found in the abdominal walls, but neither in the heart nor in the lungs could a needle be found. It is not impossible that it was carried away during the necropsy by the constant stream of water, but it must be admitted that one of the needles found in the abdominal wall may have caused the perforations.

Sclerodermia.

At a recent meeting of the Dermatological Society Dr. Reines showed a patient who suffered from sclerodermia in the stage of generalisation. The patient, a woman, aged 36 years, began to suffer from headaches nine months ago. This was soon followed by pains and swelling of the upper extremities which caused her to become an in-patient of a hospital and thus the progress of the "rheumatoid" affection could be watched. Her temperature was subfebrile. The acute inflammatory conditions soon disappeared, but the swelling and tenderness persisted, and the face of the patient assumed the peculiar wax-like aspect. Gradually the skin became sclerotic, the movements of the joints of the arms and fingers as well as the neck were less and less extensive, and the colour of the nails turned a peculiar yellow. Pressure of the finger on the infiltrated skin did not cause any pitting but only a slowly-disappearing yellowish-red patch. In such cases the administration of thyroidin (extract of the thyroid gland of sheep or goats) and the uviol or quartz lamp had been used with much benefit. As a rule cases of universal sclerodermia were very refractory to treatment. Massage, salol, and hot air were the best for them. Circumscribed areas affected with the disease were very much improved by thyroidin.

Surgical Treatment of Rhinophyma.

The results of the operation for the serious disfigurement caused by the large red wart-like enlargement of rhinophyma have hitherto been not very satisfactory on account of the subsequent discolouration of the parts and transplantation of healthy skin from other regions gave the patient an unsightly appearance owing to the contrast between the acne of the face and the pale new covering of the nose. Professor Gersuny, therefore, worked out the following method and used it with great success on a very marked case of rhinophyma. The operation was performed under local anæsthesia produced by a solution of cocaine of 1 per cent. strength, only a few grains of the alkaloid being used. The tumours were incised near their border so that the underlying cartilage was exposed. Then the skin was undermined all around and the tumour removed, thus leaving a free narrow edge of true skin everywhere. This free edge was fixed to the wound by a few sutures. The saving of this free edge is important as it serves as a margin for the tip and the edge of the nose. Then the remaining wound was covered by flaps of epidermis taken from the extirpated tumours. The dressing consists of gutta-percha tissue fixed to the skin by means of chloroform. The dressing can be removed after four or five days. The chief advantages of this method are: (1) the natural appearance of the nose is preserved after the operation because there is no difference in colour between the new skin and the surrounding parts of the face; and (2) the removal of the large masses tends to improve the vascular condition in the face, so that the often concomitant acne rosacea disappears or is much diminished. Seven patients have hitherto been operated upon by this method with very good results.

The Twenty-fifth Congress of Internal Medicine.

The Twenty-fifth Congress of Internal Medicine will be held in Vienna from April 6th to 9th. Professor von Müller (Munich) will be the President. The following programme of subjects to be discussed has been agreed upon: (1) The Correlation between the Female Genital Organs and Internal Diseases, to be introduced by Dr. von Rosthorn (Heidelberg) and Dr. Lenhartz (Hamburg); (2) The Methods of Examination of the Function of the Intestines, to be introduced by Dr. Schmidt (Halle); and (3) Diseases of Circulation and the Blood Pressure. An exhibition of instruments, preparations, and apparatus so far as they pertain to internal medicine will be held at the same time as the congress and will be in charge of Professor Schlesinger (Vienna I.). The number of papers promised is already about 100, so that the transactions will cover a very large field.

Extirpation of the Saphenous Vein.

At a recent meeting of the Gesellschaft der Aerzte Professor Schnitzler showed two women on whom he had operated for phlebitis of the saphenous vein. The first case was one of acute phlebitis during the third month of pregnancy. The woman had suffered repeatedly from the phlebitis and as the attacks had lasted for a long time the operation was readily consented to. Professor Schnitzler made an incision from Poupart's ligament down to the internal malleolus, and the thrombosed vein, which appeared cordlike and had many nodules, was extirpated, after which the wound was sutured. Primary union took place and an uneventful recovery was followed by complete relief. The second case was operated upon during the absence of acute symptoms. In such cases it was possible to remove the whole vein by a series of small incisions from four to six centimetres (two to three inches) long separated from each other by intervals varying from 8 to 15 centimetres (four to seven inches); the next stage consisted in mobilising the vein and loosening it from its attachments. The small incisions caused less disfigurement and were followed by quicker healing. Professor Schnitzler was very satisfied with the results of this operation for varicose veins whether inflamed or not. The danger of embolism was lessened by primary high ligature of the veins.

Carcinoma of the Penis.

At the same meeting Professor Spiegler showed a case of epithelioma of the penis of a strong, otherwise healthy, man aged 38 years. It was of the size of a chestnut, was said to have originated eight months ago, and was situated on the inner wall of the prepuce. Its place of origin was probably one of the sebaceous glands. The removal of such epitheliomata, he said, was very easy and if done early enough it might be followed by complete freedom from relapse. It was interesting to note that even large epitheliomata did not often interfere with cohabitation because they were attended with little, if any, pain, whilst the flat tumour caused no pressure.

Jan. 3rd.

NEW ZEALAND.

(FROM OUR OWN CORRESPONDENT.)

The Sale of Food and Drugs Bill.

AFTER careful consideration by the Members of the Lower House this measure was sent on to the Legislative Council. There some important amendments were made which have resulted in the Bill being improved. Its original title, "Pure Foods Bill," was objected to by many because it suggested—shall it be said to the unthinking?—that only foods and drugs unmixed with anything else could be sold. As its object was to secure wholesome food, nothing was lost by the

Honourable George Fowlds, Minister of Public Health, agreeing to the alteration of the name. In some ways its sphere was enlarged by an amendment which brought cigars, cigarettes, and tobacco under the Act. The excellent Act which was passed last year by the Victorian Legislature has been largely followed but in many ways advanced upon. The interpretation clauses in the Act are of a very wide nature, and the merchant who wants to drive the proverbial "coach and four" through the statute will have to be well coached. The definition of "sell" includes in its widest sense that set out by the latest English text-book :—

"Sale" or "sell" includes barter, and also includes offering or attempting to sell or receiving for sale, or having in possession for sale, or exposing for sale, or sending or delivering for sale, or causing or allowing to be sold, offered, or exposed for sale, and refers only to sale for human consumption or use.

Within recent years a large number of prosecutions for the sale of watered milk fell through, because, in answer to the vendor, the inspector who bought the samples admitted that they were bought for analysis. This was held to exclude the possibility of their having been sold for human consumption, and so the cases were dismissed. In the new Act the wording has been altered to—

The officer purchasing or otherwise procuring it shall before or forthwith after procuring it inform the seller or his agent selling the article that he intends to have the same analysed by an analyst.

In addition to the usual power of entering upon premises for the examination and collection of samples of suspected foods and drugs the chief health officer has power to make copies of any books kept by any merchant whom he has cause to suspect to be dealing in goods the sale of which is prohibited by the Act. Then, again, while the interests of the vendor are conserved special powers are given to the health officials to destroy food or drugs which are found unsound. Section 13 run as follows :—

1. Every person commits an offence who sells any adulterated food or adulterated drug without fully informing the purchaser at the time of the sale of the nature of the adulteration, unless the package *in which it is sold has* conspicuously printed thereon a true description of the composition of such food or drug.
2. Every person commits an offence who sells any food or drug in any package which bears or has attached thereto any false or misleading statement, word, brand, label, or mark purporting to indicate the nature, quality, strength, purity, composition, *weight*, origin, age, or proportion of the article contained in the package or of any ingredient thereof.
3. Every person commits an offence who sells any food or drug containing any substance the addition of which is prohibited by regulations made under the authority of this Act.
4. Every person commits an offence who sells any food or drug containing a greater proportion of any substance than is permitted by regulations made under the authority of this Act.
5. Every person commits an offence who sells any food which contains methyl alcohol, or which, not having paid Customs or excise duty, contains more than two parts of proof spirit per centum.
6. Every person commits an offence who sells any food which is unsound or unfit for human consumption.
7. Every person committing any offence mentioned in this section is liable for the first offence to a fine not exceeding *fifty* pounds, and for any subsequent offence under the said section (whether of the same or a different nature) to a fine not exceeding *two* hundred pounds: Provided that if any such offence is wilfully committed, the person so committing it is liable to a fine not exceeding *two* hundred pounds or to *three* months' imprisonment, although it may be a first offence.
8. The provisions of subsection *one* of this section are subject to such exceptions as may be prescribed by regulations made by the Governor in Council and gazetted.

It will be seen from this that the seller of an adulterated article, while he is quite free to sell it, must at the time of sale make it quite clear to the buyer that it is, say, a mixture of starch and pepper or chicory and coffee that he is selling. Provided he does this he is liable to no penalty. The question of reliance upon a warranty is fully dealt with and where the proximate vendor sells under a warranty he can enter such warranty as a defence, provided he gives the prosecutor notice of his intention to rely upon such warranty. No warranty granted outside the dominion would be of any avail. A vendor of an adulterated article living in another country could not, of course, be attached in any action taken in New Zealand, and hence the indentor of the maker in the dominion must be made responsible. Section 27, which really contains the essence of the Bill, is far-reaching and ought to make largely for the betterment of the food-stuffs consumed in New Zealand. For many years the system of supervision exercised over beef, mutton, butter, cheese, &c., for export has been most thorough. The same has not obtained with regard to the food-stuffs consumed within the dominion.

Section 27 (1). The Governor may from time to time, by Order in Council gazetted, make regulations—(*a*) Prescribing the standard of strength, weight, quality, or quantity of any food or drug, or of any ingredient or component part thereof; (*b*) prohibiting the addition of any specified thing, or of more than the specified quantity or proportion thereof, to any food or drug; (*c*) prohibiting any modes of manufacture, preparation, or preservation of any food or drug; (*d*) securing the cleanliness and freedom from contamination of any food or drug in the course of its manufacture, preparation, storage, packing, carriage, delivery, *or exposure for sale*, and securing the cleanliness of places, receptacles, appliances, and vehicles used in such manufacture, preparation, storage, packing, carriage, or delivery; (*e*) prescribing the mode of labelling food or drugs sold in packages and the matter to be contained, or not to be contained, in such labels; (*f*) prescribing the method of analysis of any food or drug; (*g*) fixing fees to be paid in respect of the analysis of any food or drug by an analyst; (*h*) prohibiting the sale of specified articles of food otherwise than by weight; (*i*) prescribing fines not exceeding *fifty* pounds for the breach of any regulation; and (*j*) generally for carrying out the purposes of this Act.

2. Any such regulation may be made applicable either to food or drugs generally or to specified foods or drugs only.

The power to set up standards for foods and drugs is similar to that in Victoria and some of the American States, but New Zealand goes further in some ways than any statutes which I have been able to study. There would seem at first sight to be no valid reason why many articles of food now sold by "pairs" should not be sold by weight. Potatoes are sold by weight, yet eggs by the dozen; ordinary bread by weight, yet fancy bread by the piece; turkey is sold by weight but chickens are not; and so on. Power is given in this Act to say what articles shall be sold by weight. The sections dealing with the alleged 2 pound and 4 pound loaf have been framed with very great care and will tend to check some of the frauds through short weight. If a loaf is less than 2 pounds and more than 1 pound the vendor shall be deemed to have sold a 2 pound loaf; if it is more than 3 pounds and less than 4 pounds he shall be deemed to have sold a 4 pound loaf. Many buyers would only ask for "a large loaf" or "a small loaf," and but for such a clause as this it would be difficult to prove that the vendor sold the loaf as a 2 pound or a 4 pound. Carelessness on the part of the buyer will not now protect the seller if the loaf is under weight.

Nov. 22nd, 1907.

Obituary.

WILLIAM ARCHIBALD LOGAN, M.B., B.S. NEW ZEAL., F.R.C.S. ENG.

THE medical profession in New Zealand has suffered a severe loss in the death of Mr. William A. Logan, which occurred in London on Dec. 21st, 1907. Mr. Logan was one of the most brilliant students whom the University of New Zealand has ever produced. He graduated as M.B. and B.S. at Dunedin in 1898, held the house appointment in the Dunedin Hospital in that year, and then came to London, where he took the diploma of M.R.C.S. Eng., and in 1900 that of F.R.C.S. Eng. Returning to New Zealand he was for a time surgeon to the Timaru Hospital and then settled in practice in Wellington where his ability as a surgeon soon became widely known and secured for him an extensive practice. Early in 1907 he returned to London where he successfully underwent an operation for gastric ulcer and remained to increase his surgical knowledge. A few weeks ago he developed signs of mastoid trouble which, in spite of prompt surgical interference, terminated fatally. A valuable life and the promise of a great surgeon were thus cut short at the early age of 33 years, and New Zealand has lost a typical example of the class of man of which any country might be proud.

HARRY ALCOCK DIXON, M.R.C.S. ENG.

Mr. Harry Alcock Dixon of Burnley died there at his residence in Oxford-road on Dec. 24th, 1907, after about a week's illness. He was born at Rose Cottage in the same town in 1849, his father being Mr. John Alcock Dixon, a solicitor. The later portion of his school education was received at Rossall College and Stonyhurst College, and he was subsequently apprenticed for seven years at the Royal Infirmary, Manchester, being the last senior apprentice connected with that institution. In 1880 he took the diploma of M.R.C.S. Eng. and immediately commenced practice in Burnley at Mabel-terrace, Oxford-road. Mr. Dixon was a Freemason and an Oddfellow and was for some time churchwarden of St. Stephen's Church, Burnley. In 1890 he had an unusual experience as a candidate for municipal honours; on the first counting of the votes he was declared to be elected, but on a recount being made he was

found to have a minority of votes. Some time ago he received a presentation in recognition of his services as an instructor of ambulance classes. Mr. Dixon was a widower and has left two sons, one of whom is a medical man. The funeral took place at St. Peter's churchyard on Dec. 27th and was largely attended.

JAMES FORSYTH, M.R.C.S. ENG.

Mr. James Forsyth of Eyemouth, a small seaport town in Berwickshire, died on Dec. 29th, 1907, at the age of 79 years. He received his professional training at the University of Edinburgh and took the diploma of M.R.C.S. Eng. in 1855. He was one of the oldest practising medical men in his part of the country. For nearly 50 years he had acted as medical officer for the district and also held the appointment of Admiralty surgeon and agent. He was also the oldest member of the local lodge of Freemasons and was for many years senior elder of St. John's United Presbyterian Church.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Unruh of the Children's Hospital, Dresden. —Dr. William B. Belcher, lecturer on materia medica at Long Island College Hospital, Brooklyn.

Medical News.

UNIVERSITY OF OXFORD.—At examinations held recently the following candidates passed in the subjects indicated:—

Mechanics and Physics.—C. F. Beeson, non-collegiate; C. M. Berlein, New College; B. Blackman, Queen's; C. M. Burrell, University College; A. F. Coventry, Magdalen; C. L. Cumming, Trinity; J. C. Ellis, Jesus; R. A. Fisher, Balliol; J. G. Fry, Exeter; R. A. Gillis, St. John's; W. R. Grose, Keble; E. Hancock, Lincoln; R. St. A. Heathcote, New College; S. Holliday and Lal. C. Khosla, non-collegiate; H. S. Knowlton, Keble; A. M. Munro, St. John's; A. L. Parson, Christ Church; J. L. R. Pastfield, Worcester; R. Ross, non-collegiate; E. G. Swann, St. Edmund Hall; J. R. Thomas, Jesus; W. W. Waller, New College; and J. W. Woodrow, Queen's.

Animal Physiology.—D. H. Jones, Jesus.

Botany.—R. C. Briscoe, St. John's; A. M. M. Davies, University College; W. K. Flemner, Trinity; F. A. Hampton, New College; G. T. Hebert, Christ Church; A. Jackson, Queen's; M. M. Machaya and F. M. Oliphant, St. John's; W. J. Pearson, University College; E. D. Rose, St. John's; and J. Sainsbury, Oriel.

Chemistry.—H. D. Barnes, Magdalen; C. F. Beeson, non-collegiate; C. M. Berlein, New College; R. C. Briscoe, St. John's; J. Bromfield-Williams, Exeter; C. M. Burrell, University College; E. W. Carrington, Keble; A. F. Coventry, Magdalen; C. L. Cumming, Trinity; J. C. Davies, New College; C. Dean and H. C. Doyne, Trinity; J. C. B. Ellis, Jesus; F. H. Gee, non-collegiate; R. A. D. Gillis and A. C. Godson, St. John's; O. H. Gotch, New College; W. R. Grose, Keble; J. M. Guilfoyle, B.N.C.; E. Hancock, Lincoln; H. L. Harvey, Oriel; O. J. Hobbs, Merton; E. W. N. Hobhouse, New College; O. Jackson, Queen's; D. H. Jones, Jesus; H. S. Knowlton, Keble; F. C. Lacaita, Balliol; W. Lawton, St. John's; T. Lindsay, Balliol; F. S. MacNalty, Worcester; G. A. Maling, Exeter; A. M. Munro, St. John's; A. L. Parson, Christ Church; J. L. Pastfield, Keble; A. L. Pearce-Gould, Christ Church; G. B. R. Pease, University College; C. G. Roach, G. S. Robinson, and H. A. C. Sim, Exeter; E. R. Speyer, New College; J. W. G. Steell, Trinity; E. G. Swann, St. Edmund Hall; B. Tunstall Behrens, Pembroke; B. H. Walker, Queen's; B. E. Wall, Lincoln; and W. D'Arcy Ward, Trinity.

Organic Chemistry.—W. A. Cooke, Worcester; G. Cranstoun, Oriel; A. A. M. Davies, University College; A. W. Dennis, Keble; R. C. Fairbairn, Exeter; G. T. Hebert, Christ Church; A. Juett, B.N.C.; E. G. Martin, New College; E. E Mather, Exeter; R. O'Connor, Lincoln; E. L. Pearce Gould, Christ Church; W. J. Pearson, University College; R. M. Pope, Lincoln; M. O. Raven, Trinity; J. Sainsbury, Oriel; G. Stanger, Lincoln; T. O. Thompson, St. John's; J. F. Venables, Magdalen; and S. White, Keble.

Materia Medica and Pharmacy.—A. Booth, Keble; and W. F. Harvey, Balliol.

Human Anatomy and Human Physiology.—S. F. Mutch, B.N.C.; E. P. Boulton, Balliol; A. T. S. Sladden, Jesus; and A. E. Taylor, Trinity.

Pathology.—M. Bates, St. John's; C. N. Binney, Corpus Christi; N. Flower, Exeter; H. M. C. Green, Wadham; W. D. Kennedy, University College; and B. A. W. Stone, B.N.C.

Forensic Medicine and Public Health.—M. Bates, St. John's; G. D. Carpenter, non-collegiate; E. P. Cumberbatch, Keble; N. Flower, Exeter; D. B. Todd, Lincoln; S. E. Whitnall, Magdalen; and A. P. Yonge, Exeter.

Medicine, Midwifery, and Surgery.—C. G. Douglas, Magdalen; S. Hartill, Exeter; G. M. Johnson, Magdalen; B. G. Klein, Corpus Christi; and S. E. Whitnall, Magdalen.

LONGEVITY.—Mrs. B. Bushen of Minehead, Somerset, recently celebrated the hundredth anniversary of her birthday.

MEDICAL MAGISTRATE.—Mr. J. Macdonald Brown, M.D. Edin., F.R.C.S. Eng., has been appointed a justice of the peace for the county of London.

BRISTOL MEDICAL CHARITIES.—During 1907 the employees of the W. D. and H. O. Wills branch of the Imperial Tobacco Company at Bristol voluntarily collected £605 for the Bristol medical charities.

WE regret to announce the death of Mr. William H. S. Wood, the senior member of the firm of Messrs. William Wood and Co., medical publishers, New York, who died on Dec. 11th, 1907. Messrs. William Wood and Co. have acted as the special agents in New York for the distribution of THE LANCET for many years.

LITERARY INTELLIGENCE.—Messrs. W. B. Saunders and Company have in the press for early publication a Manual of the Practical Application of Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties, by Dr. Willy Meyer, professor of surgery in New York Post-Graduate School, and Professor Victor Schmeider of the Surgical Clinic, University of Berlin.

THE LEES AND RAPER MEMORIAL LECTURE, 1908.—The eighth Lees and Raper Memorial Lecture will be delivered in the Town Hall, Oxford, by Mr. William McAdam Eccles, on Tuesday, Feb. 4th, at 8 P.M. The subject chosen is "The Relation of Alcohol to Physical Deterioration and National Efficiency." The chair will be taken by the Regius Professor of Medicine in the University of Oxford, Professor William Osler. Further information and invitation cards can be obtained from the honorary secretary to the trustees, Mr. John Kempster, Broad Sanctuary Chambers, 20, Tothill-street, Westminster, S.W.

LEICESTER'S INFANTS' MILK DEPÔT.—At the last meeting of the Leicester town council a report was presented on the working of the corporation's infants' milk depôt, which was inaugurated with the primary object of reducing the infant mortality of the borough. Since July, 1906, when the depôt was opened, 782 infants have been supplied with specially prepared milk, cases which remained on the books for not more than one week being excluded from the returns. Of the 782 infants 202 were still on the books on Dec. 31st, 1907, the average time during which the remainder were fed from the depôt being 12 weeks. The total quantity of prepared milk sold since the inauguration of the institution had been just over 20,000 gallons. Not the least important part of the work done at the depôt is the giving of advice to mothers on the feeding and care of infants. In this particular department the medical officer of health has received valuable assistance from the Leicester Health Society, which has placed a trained and qualified "visitor" at his disposal. The fact that the summer of 1906 was very hot and that of 1907 cold and wet makes it difficult to demonstrate statistically how much has been effected by the depôt in reducing infant mortality. The sanitary committee of the town council, however, is of the opinion that the depôt is accomplishing a useful work and is justifying the expenditure incurred.

BRITISH HONDURAS.—In a report dated Nov. 1st, 1907, Mr. Wilfred Collet, C.M.G., Colonial Secretary of British Honduras, states that during the year 1906 the colony was free from yellow fever. In the previous history of the colony an outbreak of yellow fever, such as occurred in 1905, was always followed by a less severe outbreak in the following year. The colony has been more fortunate in this respect than its neighbours, for in all the neighbouring republics cases of yellow fever presented themselves in 1906. The immunity of British Honduras is probably due to the practice of fumigating all the small vessels coming from infected places and so destroying infected mosquitoes. An ordinance to enforce the screening of vats and the taking of other measures for preventing the breeding of the stegomyia fasciata came into force in January, 1906, in Belize, and later in other towns of the colony. The work was slow, as nearly all the vats had to be covered and prepared to take the wire gauze. The fitting of the gauze is an easy matter if the vat is properly constructed and covered. It was noticed that when the vats in any block were screened neighbouring houses were visited with flights of stegomyia, evidently looking for new breeding grounds. These migrations continued till the screening was completed. Some very bad low-lying lots in Belize have been filled in and breeding

grounds of anopheles to some extent diminished. The estimated mean population of the colony for the year 1906 was 41,007, consisting of 20,942 males and 20,065 females. The birth-rate was 32·9 and the mortality 29·9 per 1000. The number of illegitimate births was 630 out of a total of 1403. The average rainfall for the ten years 1897–1906 in Belize was 89·74 inches, the maximum—114·21 inches—being in 1900, and the minimum—65·89 inches—in 1902.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ANKLESARIA, HIRJEE NOWROJI, F.R.C.S. Edin., L.R.C.P. Edin., L.F.P.S. Glasg., L.M. & S., has been appointed Honorary Surgeon to the Sir Jamsetjee Jeejeebhoy Hospital, Bombay.

BADCOCK, E. R., M.R.C.S., L.R.C.P. Lond., has been appointed Surgeon to the General Post Office, Wandsworth Sub-district.

BATEMAN, H. E., L.R.C.P. Lond., M.R.C.S., has been appointed to the Charge of the X Ray Department of the York County Hospital.

BERGIN, FRANK GOWER, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer to the Bristol Dispensary.

CUTHBERT, JOHN, L.R.C.S. Irel., L.R.C.P. Edin., has been appointed Assistant Surgeon to the Perth Public Hospital, Western Australia.

GAYNER, J. S., L.R.C.P. Lond., M.R.C.S., has been appointed Anæsthetist to the York County Hospital.

GRAY, A. MONTAGUE H., M.D., B.S. Lond., M.R.C.P. Lond., has been appointed Obstetric Registrar to University College Hospital.

GREGOR, ALEXANDER, M.D., C.M. Aberd., has been appointed Medical Officer of Health of Falmouth.

HARKNESS, EDWARD, L.R.C.P. & S. Edin., has been appointed Public Vaccinator for the South-Eastern District of Victoria, Australia.

HARRIS, DUDLEY RAYMOND, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer for the Falmouth District and Workhouse by the Falmouth Board of Guardians.

JEWESBURY, REGINALD C., M.A., M.B., B.Ch. Oxon., M.R.C.P. Lond., has been appointed Physician to Out-patients at the Victoria Hospital for Children, Chelsea.

MCDONALD, GILBERT REGINALD, L.R.C.P., L.R.C.S., L.M. Irel., has been appointed District Medical Officer by the Tiverton (Devon) Board of Guardians.

NOBBS, ATHELSTANE, M.D. Edin., has been appointed Surgeon to the General Post Office, Putney Sub-district.

NYULASY, A. J., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Gynæcologist to the Perth Public Hospital, Western Australia.

PRICE, FLORENCE, M.B., B.S. Edin., has been appointed to the Bacteriological Department at Swansea Hospital.

RAMSAY, J. E., M.B. Lond., has been appointed Surgeon to the Perth Public Hospital, Western Australia.

THOMAS, H. DARBY, M.R.C.S., L.R.C.P. Lond., has been appointed Assistant House Surgeon at the Royal Surrey County Hospital, Guildford.

VISE, JOHN NEVILLE BLITHE, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer of Health of Chard (Somerset).

WALKER, GEORGE FRANCIS CLEGG, M.B., Ch.B. Vict., has been appointed Medical Officer of Health for the Haverfordwest (Pembrokeshire) Rural District.

WILLIAMS, LIONEL HENRY, M.D. Durh., M.R.C.S., L.S.A., has been appointed Medical Officer for the Thornbury District and Workhouse by the Thornbury (Gloucestershire) Board of Guardians.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BANGOR, CARNARVONSHIRE AND ANGLESEY INFIRMARY.—House Surgeon. Salary £80 per annum, with board, washing, and lodging.

BOROUGH OF ASTON MANOR, EDUCATION COMMITTEE.—Medical Officer (female). Salary £200 per annum.

BRECON AND RADNOR JOINT COUNTIES ASYLUM, Talgarth, R.S.O., Breconshire.—Assistant Medical Officer, unmarried. Salary £170 per annum, with apartments, board, washing, and attendance.

BRIDGE OF WEIR, CONSUMPTION SANATORIA.—Assistant Resident Medical Officer (female).

BRIGHTON, SUSSEX COUNTY HOSPITAL.—Second House Surgeon, unmarried. Salary £60 per annum, with board and residence.

BRIGHTON THROAT AND EAR HOSPITAL, Church-street, Queen's-road.—Non-resident House Surgeon for six months, renewable. Salary at rate of £75 per annum.

BURY INFIRMARY.—Junior House Surgeon. Salary £80, increasing to £90 after six months, with board, residence, and attendance.

CARMARTHEN, JOINT COUNTIES LUNATIC ASYLUM.—Assistant Medical Officer. Salary £200 per annum, with board, lodging, washing, and attendance.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Senior House Surgeon. Salary £120 per year, with board, apartments, and laundress.

CITY DISPENSARY, 29 and 30, College-street, Dowgate-hill, E.C.—Surgeon.

COLCHESTER, ESSEX AND COLCHESTER GENERAL HOSPITAL.—House Physician. Salary £80 per annum, with board, residence, and washing.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Assistant House Surgeon for six months. Salary at rate of £60 per annum, with board, residence, and washing.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with apartments, board, &c.

ENNISKILLEN, FERMANAGH COUNTY HOSPITAL.—House Surgeon. Salary £52 per annum.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—Pathologist and Curator. Salary £100 per annum.

HARTLEPOOLS HOSPITAL.—House Surgeon. Salary £100 per annum, with board, washing, and lodging.

HULL, ROYAL INFIRMARY.—Two Casualty House Surgeons. Salary at rate of £60 per annum for six months and of £80 for 12 months, with board and lodging.

INFANTS' HOSPITAL, Vincent-square, Westminster, S.W.—Qualified Clinical Assistant.

LEEDS, HOSPITAL FOR WOMEN AND CHILDREN.—House Surgeon. Salary at rate of £50 per annum, with board.

LEEDS PUBLIC DISPENSARY.—Junior Resident Medical Officer. Salary £100, with board and lodging.

LONDON FEVER HOSPITAL, Liverpool-road, N.—Resident Medical Officer. Salary £250 per annum, with board and residence.

MAIDSTONE, KENT COUNTY ASYLUM.—Fourth Assistant Medical Officer, unmarried. Salary £175 per annum, with quarters, attendance, coal, gas, &c.

MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Hampstead and Northwood, Middlesex.—Junior Resident Medical Officer. Salary £50 per annum, with board, lodging, &c.

NATIONAL HOSPITAL FOR THE RELIEF AND CURE OF THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury.—Assistant Physician for Out-patients.

NORTHAMPTON, BERRY WOOD ASYLUM.—Junior Assistant Medical Officer, unmarried. Salary £150, increasing to £200, with board, lodging, and washing.

NORTHAMPTON GENERAL HOSPITAL.—Assistant House Surgeon, unmarried. Salary £50 per annum, with apartments, board, washing, and attendance.

NORTH-EASTERN HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Assistant Physician.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Honorary Anæsthetist, also Honorary Radiographer.

POPLAR WORKHOUSE, Forest-lane, Forest Gate.—Medical Officer. Salary £100 per annum.

ST. GEORGE'S HOSPITAL, S.W.—Physician, also Assistant Physician.

ST. PANCRAS INFIRMARY AND WORKHOUSE, Pancras-road.—Junior Assistant Medical Superintendent and Medical Officer (female). Joint salary £80 per annum, with board, apartments, and washing.

SOMERSET COUNTY COUNCIL.—Chief Medical Inspector of Schools. Salary £500 per annum, with necessary out-of-pocket expenses.

SUNDERLAND, MONKWEARMOUTH AND SOUTHWICK HOSPITAL.—House Surgeon. Salary £100 per annum, with board, lodging, and washing.

TIVERTON, DEVONSHIRE, INFIRMARY AND DISPENSARY.—House Surgeon and Dispenser. Salary £80 and all found.

VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST ON THE SEPARATE PRINCIPLE.—Two Assistant Resident Medical Officers, unmarried. Salary £100 per annum, with board and lodging.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—Senior Resident Medical Officer. Salary £105 per annum, with board, residence, and washing.

WEST-END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, PARALYSIS, AND EPILEPSY, 73, Welbeck-street, London, W.—Physician to Out-patients.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Rathfriland, in the county of Down; and at Strathmiglo, in the county of Fife.

Births, Marriages, and Deaths.

BIRTHS.

ADDINSELL.—On Jan. 3rd, at 6, St. James'-road, Surbiton, the wife of John Howard Addinsell, M.R.C.S., L.R.C.P., of a son.

BENTLEY.—On Dec. 27th, 1907, at Haworth, Mitcham, the wife of Harold Bentley, B.A. Camb., M.R.C.S., L.R.C.P., of a daughter.

FLEMMING.—On Jan. 7th, at 34, Alma-road, Clifton, Bristol, the wife of A. L. Flemming, L.R.C.P., M.R.C.S., of a daughter.

MAY.—On Jan. 2nd, at Woodleigh, Ware, Herts, the wife of George Ernest May, M.R.C.S., L.R.C.P., of a son.

MORLEY.—On Jan. 6th, at 29, Gower-street, Bedford-square, the wife of Arthur S. Morley, of a son.

THORNE THORNE.—On Jan. 3rd, at "Grasmere," Mount Vernon-road, Woking, the wife of Berthold Thorne Thorne, M.D., of a daughter.

TOWNSEND.—On Dec. 31st, 1907, at Barnwood, near Gloucester, the wife of Arthur A. D. Townsend, M.D., of a son.

WOLFE.—On Dec. 14th, 1907, at Paarl, Cape of Good Hope, the wife of Robert Inglewood Wolfe, J.P., District Surgeon, of a son.

DEATHS.

BIRCH.—On Jan. 1st, at St. Leonards-on-Sea, Scholes Butler Birch, M.D., M.R.C.P. Lond., in his 82nd year.

PHILLIPS.—On Dec. 27th, 1907, at Cairo, Egypt, Gwyneth Helen Powell Phillips, the only child of Dr. and Mrs. Llewellyn Phillips, aged two years and four months.

TOONE-SMITH.—On Jan. 6th, at West Chapel-street, Mayfair, T. W. Toone-Smith, M.D., M.R.C.S., in his 71st year.

TURNER.—On Jan. 8th, at 6, Eton-terrace, Edinburgh, Agnes Logan, wife of Sir William Turner, K.C.B., Principal of the University.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

A LAMENT FOR THE WARMING-PAN.

A FREQUENT correspondent writes:—During the Arctic weather of last week many people after spending the evening in a warm and cheerful room must have contemplated with shuddering distaste the necessity of leaving their armchair for an unwarmed bedroom and a plunge into icy sheets. Such a one, putting off until the latest moment the unwelcome ascent, may have seen a ruddy gleam of light reflected from his fire upon the patterned copper disc of a long-disused warming-pan, for these articles, having for many years been divorced from their special purpose, now form the ridiculous adornment of many dining-rooms or halls. Such a man may well have sighed to think that in his grandfather's days that warming-pan would have had an intrinsic glow and ministered to more primitive senses than the æsthetic eye. And going upstairs at last he has either, like hundreds of thousands of his fellows, used for half-an-hour an ill-spared portion of his body heat in warming his bed-clothes, or perhaps has so far forfeited his self-respect as to take to bed with him a hot-water bottle which formed a scorching focus in a tiny area surrounded by an infinite icy waste, made all the colder by contrast with that unsatisfactory source of excessive local heat, a device which was either of earthenware and extremely clumsy, or of indiarubber, and very possibly leaky. Can the advantages of such an unsatisfactory contrivance—which is hardly more ingenious than the primitive hot brick and of which no man would readily acknowledge the use—be compared with those of the old-fashioned brazier with which the old-fashioned domestic was wont to prepare the beds of chilly people? It warmed the bed-clothes thoroughly and evenly, it left no foreign body in the bed to shock the feet with its lukewarmness in the cold hours of the morning, and it preserved the self-respect of those who benefited by it, for no man could object to enter sheets warmed, as it were, providentially against his arrival. I acknowledge the inevitability of the passing of the warming-pan into the limbo of a more leisurely age, for I am convinced that no modern serving-maid would take kindly to its use; but it is well to know that science has to some extent made good its loss. I understand that an electrical warming-pan, the superiority of which to its predecessor is obvious, has been made for several years but of course it is available only for him who has an installation of the electric light. Equally of course it is a luxury, but to many old people it would be a real boon to get nightly into well-warmed sheets in cold weather, and such may profit by the modern warming-pan and need no more cast regretful eyes at the picturesque relic on their walls.

THE ALABONE TREATMENT.

To the Editor of THE LANCET.

SIR,—Objection has been taken by Mr. E. W. Alabone to paragraph 158 of the Annual Report of the London and Counties Medical Protection Society, Limited, for the year 1906, on the ground that it conveys the impression that Mr. E. W. Alabone has converted his practice, in the treatment of consumption, into a company. Mr. E. W. Alabone wishes it known that this is not so.

Will you kindly allow me to convey this information to your readers.

I am, Sir, yours faithfully,

HUGH WOODS, M.D. Dub.,
General Secretary, London and Counties Medical Protection Society, Limited.

*** We publish this letter at the request of that excellent professional institution, the London and Counties Medical Protection Society, Limited. We must, however, point out that our readers have no interest whatever in the information.—ED. L.

A MEDICAL ADVERTISEMENT.

WE have received a copy of the *Roman Herald*, of date Dec. 14th, 1907. This is a weekly newspaper written in English and published in Rome "for the use and assistance of tourists and residents in Italy." In the issue in question there occurs in a column headed "Round about Rome" an advertisement of a registered British practitioner, under the cross-heading "Dr. Grace Mackinnon," in very bold type. The paragraph beneath states that this lady has arrived in Rome, which city is to be congratulated on the event, as she has had great experience in the diseases of women and children in her hospital in India and general practise (*sic*); that she was for a time the head of the Consumption Hospital at the Bridge of Weir, Scotland; and that the Government of India has bestowed upon her the order of the Kaisar-i-Hind in acknowledgment of her services in that country. We find that the lady was educated at the London School of Medicine for Women and has been medical superintendent at the Consumption Hospital at Bridge of Weir and the Duchess of Teck Hospital at Patna, India. Her qualifications are L.R.C.P., L.R.C.S. Edin., 1889. Doubtless the advertisement is the work of some injudicious friend of Miss Mackinnon who should promptly repudiate it.

CATS AND PLAGUE.

To the Editor of THE LANCET.

SIR,—Jenner was led to his immortal discovery by the fact that the Gloucestershire dairymaids were exempt from small-pox. It would be a remarkable coincidence if the discovery of an antidote for the plague in India should be traceable to the freedom from that pestilence enjoyed by the inhabitants of villages where milch cattle abound. In January, 1907, the attention of Lieutenant-Colonel Andrew Buchanan, I.M.S., was drawn to a village named Airla, which was situated by the side of the road between Nagpur and Kalmeshwar. Plague was rife in the two latter places, but the former was, and always had been, immune. He made inquiries and found that the inhabitants of Airla all kept buffaloes. Milk was abundant and the village consequently swarmed with cats which were attracted by it. Colonel Buchanan then made inquiries in other villages, first in the Nagpur district and then in the Amraoti district, and found it was the rule that where there were many buffaloes there were many cats and seldom or never a case of plague. This interesting information is to be found in an article by Colonel Buchanan in the *Indian Medical Gazette* for October. In this article the writer amplifies his previous statements regarding his cat census and mentions some more of its striking results. Among other noteworthy facts the following is peculiarly interesting. "A village named Wandl was reported to have 61 per cent. of cats and yet 13 cases of plague occurred. Special inquiries were made in this village and it was found that many of the cats had been introduced after plague had occurred. There were 13 houses with cats before the plague began and no case occurred in any of these houses." In another letter which is published in the *Pioneer Mail* of Oct. 11th Colonel Buchanan replies to the contention of a correspondent in England to the effect that cats can convey the infection of plague from rats to the human subject and are therefore a source of danger to the public health. Cats are liable to plague, he admits, but they do not spread it. In the instance quoted by the correspondent there is nothing to show that the lady and the cat did not both acquire the disease from the same rat. He understands that at the Parel Laboratory it was ascertained that the cat flea does not convey plague as the rat flea does. Of course, it is possible that a rat flea may have been conveyed on a cat, but the fact that a flea had been carried in a coat would not be accepted as an argument against wearing clothes. Where cats abound there will be no plague because in that case the rats will avoid entering the houses. The following incidents related by Colonel Buchanan are strongly confirmatory of his theory. "I passed to-day through Asegaon, a village with a population of 700. Plague began there about a month ago, and there had been 35 cases before the inhabitants evacuated. Inquiries were made from eight men who happened to be on the road side. In the houses of seven there had been cats and no plague; in the house of the other there had been plague but no cat." "Daryapur, a town in the west of the district, was visited by a severe epidemic last plague season. An American missionary, who is a believer in Faith curing, lived near the middle of the town and when nearly all the people went out he and his family remained. None of them took plague and, no doubt, he would have quoted himself and family as instances of the value of his particular form of belief had it not happened that, quite casually, he mentioned to me that when the people left the town his household was troubled with 13 or 14 cats that kept coming to the house, and that his wife occasionally fed them. To the question, 'Has it never occurred to you that you and your family owe your lives to these cats?' he replied that the thought had never struck him." "The *Quasasal Ambia* is a well-known religious book of the Mahomedans. In it there is an account of the Great Flood, of the building of the ark by Noah, of the creation of rats (N.B. by the Devil), of their rapid multiplication, of their eating holes in the ark so that the lives of all on board were in danger, and of the creation of cats (N.B. at the suggestion of the Angel Gabriel) for the special purpose of destroying the rats. The cats killed off the rats and saved the ark, and there is no more effectual way of appealing to the Mahomedans than to draw a comparison between the danger that Noah experienced from rats and the risks which they now undergo from the same animals. They, at any rate, will not believe that cats spread plague." In conclusion, Colonel Buchanan says: "It will be understood that the observations which have been given here have been made in a limited area, and I hope that others will make inquiries in other parts of India and record how far the cat would account for freedom from plague, or the reverse." I hope so too, for it certainly appears that Colonel Buchanan has made out a strong *primâ facie* case in favour of the cat.

I am, Sir, yours faithfully,

VETERAN.

THE STERILISATION OF CATHETERS AND CYSTOSCOPES.

AT the Congress of the German Urological Society recently held in Vienna Dr. Arthur Weiss of Vienna read a paper on an Apparatus for Sterilising Catheters and Cystoscopes by exposure to the vapour of "autan." From a copy of his paper which he has sent to us it appears that this substance is a preparation of formaldehyde and that in the application of it steam was simultaneously evolved by which the polymerisation of formaldehyde into paraform was prevented. In his experiments he infected catheters of different sizes by passing through them solutions containing many kinds of virulent bacteria. On exposure to the vapour of autan all the catheters, even those of the smallest calibre, were completely sterilised. Pure cultures of tubercle bacilli were effectually killed by

the vapour, as was proved by injecting the cultures so treated into the peritoneum of guinea-pigs; the animals lived for six weeks in perfect health and when killed they showed no trace of tuberculous disease. Dr. Weiss has designed an apparatus in which catheters to be sterilised are placed in a glass tube connected with a glass vessel in which form aldehyde gas is evolved by stirring with water a powder composed of a metallic peroxide and paraform. An exposure of two hours for large catheters and three hours for small ones suffices for complete sterilisation.

THE TREATMENT OF PILES.

To the Editor of THE LANCET.

SIR,—I shall be greatly obliged if any of your readers will favour me with their experience of the treatment of piles by injection with carbolic acid or any other treatment otherwise than operative, and shall be especially thankful to know if the treatment by injection is dangerous.

I am, Sir, yours faithfully,

Jan. 6th, 1908. M.D.

House Surgeon.—We should say that a reasonable fee would be half-a-guinea. The question—to whom should the fee go—depends upon the rule of the hospital at which the medical officer holds his appointment. At most hospitals the resident medical officers are considered entitled to the fees which they may earn in this or similar ways, but of course if there is any definite rule on the matter at the particular hospital in question our correspondent must abide by it.

M. R.—The General Medical Council has no jurisdiction over medical men whose names do not appear on the Register. A prosecution might lie against this person if he were pretending to have medical qualifications which he did not possess, but if he is a graduate in medicine and is not on the Register his position is unassailable.

M.R.C.S., &c.—We disapprove highly of the dissemination of such handbills but we cannot accuse in our columns a member of the medical profession of improper advertisement upon the information supplied to us. Our correspondent desires to remain anonymous and does not give us the name of his informant.

Erratum.—Dr. J. S. Purdy of the Public Health Service of New Zealand has written to correct an error in an annotation on the Treatment of Gonorrhœa in THE LANCET of May 18th, 1907, p. 1377. This article referred to a previous contribution by Dr. Purdy in THE LANCET of Dec. 19th, 1903, p. 1716, concerning which we wrote: "Dr. Purdy has previously published his experience in the treatment of gonorrhœa with the new organic compound of silver, protargol, at the Lock Hospital." In place of *protargol* we should have written *argyrol*.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (13th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (3 P.M.), St. Mark's (2.30 P.M.).

TUESDAY (14th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (2 P.M., Ophthalmic, 2.15 P.M.), Tottenham (2.30 P.M.).

WEDNESDAY (15th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.).

THURSDAY (16th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (2.30 P.M.), Tottenham (Gynæcological, 2.30 P.M.).

FRIDAY (17th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9 30 A.M.), Samaritan (9 30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2 30 P.M.), St. Peter's (2 P.M.).

SATURDAY (18th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 20, Hanover-square, W.

TUESDAY.—(*Surgical Section*), 5.30 P.M., Mr. H. L. Barnard: Some Surgical Aspects of Subphrenic Abscess.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Dr. A. C. Inman: The Opsonic Index in Tuberculous Patients engaged in Physical Exercise. Dr. M. S. Paterson: Graduated Labour in Pulmonary Tuberculosis.

SOCIETY FOR THE STUDY OF INEBRIETY, 11, Chandos-street, Cavendish-square, W.

TUESDAY.—3.30 P.M., Council Meeting. 4 P.M., Discussion on the Teaching of Hygiene and Temperance in Schools and Colleges (opened by Mr. W. N. Edwards).

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.

WEDNESDAY.—8 P.M., Mr. W. Wesché: On the Microscope as an Aid to the Study of the Biology of Insects, with Special Reference to the Food. Mr. J. C. Barnard: Exhibition and Description of an Improved Type of Mercury Vapour Lamp for Use with the Microscope.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 20, Hanover-square, W.

FRIDAY.—8 30 P.M., Dr. G. C. Low: The Unequal Distribution of Filariasis in the Tropics. Dr. C. Brown: Biographical Sketch of the late Professor Fritz Schaudinn.

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN, 11, Chandos street, Cavendish-square, W.

FRIDAY.—4 30 P.M., Dr. G. Carpenter: Successful Medical Treatment of Congenital Hypertrophic Obstruction of the Pylorus. Dr. E. Cautley: Pathology of Congenital Hypertrophy of the Pylorus in Relation to Treatment. Dr. Whipham, Dr. P. Parkinson, Dr. Carpenter, and others: Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. H. G. Adamson: Clinique (Skin). 5.15 P.M., Lecture: Mr. A. Carless:—Some Internal Derangements of the Knee-joint.

TUESDAY.—4 P.M., Dr. C. O. Hawthorne: Clinique (Medical). 5.15 P.M., Lecture:—Dr. T. C. Stevens: The Diagnosis and Treatment of Acute Abdominal Conditions originating in the Genital Organs.

WEDNESDAY.—4 P.M., Mr. P. Daniel: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. C. Mercier: Functional Disease and its Treatment.

THURSDAY.—4 P.M., Mr. Hutchinson: Clinique (Surgical). 5.15 P.M., Lecture:—Sir Almroth Wright: Some Points in connexion with Therapeutic Inoculation.

FRIDAY.—4 P.M., Mr. B. Harman: Clinique (Eye).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith road, W.

MONDAY.—12 noon: Lecture:—Dr. Low: Pathological. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eye. 2.30 P.M., Operations. 5 P.M., Lecture:—Dr. Saunders: Clinical, with cases.

TUESDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. 12 noon: Lecture:—Dr. Pritchard: Medical. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Ball: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Dr. Low: Filariasis.

WEDNESDAY.—10 A.M., Dr. Ball: Diseases of the Nose, Throat, and Ear. Dr. Saunders: Diseases of Children. 2 P.M., Medical and Surgical Clinics. Dr. K. Scott: Diseases of the Eye. X Rays. 2.30 P.M., Operations. 5 P.M., Lecture:—Dr. Beddard: Practical Medicine.

THURSDAY.—12 noon, Lecture:—Dr. Pritchard: Medical. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eye. 2.30 P.M., Operations. 5 P.M., Lecture:—Mr. Baldwin: Practical Surgery.

FRIDAY.—10 A.M., Dr. M. Moullin: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Ball: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Dr. K. Scott: The Prescribing of Spectacles.

SATURDAY.—10 A.M., Dr. Ball: Diseases of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. K. Scott: Diseases of the Eye. 2.30 P.M., Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Cliniques:—10 A.M., Surgical Out-patient (Mr. H. Evans). 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham): Throat, Nose, and Ear (Mr. H. W. Carson); X Ray (Dr. A. H. Pirie). 4.30 P.M., Medical In-patient (Dr. A. J. Whiting).

TUESDAY.—Clinique:—10.30 A.M., Medical Out-patient (Dr. A. G. Auld). 2.30 P.M., Surgical Operations (Mr. Carson). Cliniques:—Surgical Out-patient (Mr. Edmunds); Gynæcological (Dr. A. E. Giles). 4.30 P.M., Lecture:—Dr. M. Leslie: Dropsy, its Significance and Treatment.

WEDNESDAY.—Cliniques:—2.30 P.M., Medical Out-patient (Dr. Whipham); Dermatological (Dr. G. N. Meachen); Ophthalmological (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations. (Dr. Giles). Cliniques:—Medical Out-patient (Dr. Whiting); Surgical Out-patient (Mr. Carson); X Ray (Dr. Pirie). 3 P.M., Medical In-patient (Dr. G. P. Chappel). 4.30 P.M., Lecture-Demonstration:—Dr. G. N. Meachen: Selected Skin Cases.

FRIDAY.—10 A.M., Clinique:—Surgical Out-patient (Mr. H. Evans). 2.30 P.M., Surgical Operations (Mr. Edmunds). Cliniques:—Medical Out-patient (Dr. Auld); Eye (Mr. Brooks). 3 P.M., Medical In-patient (Dr. M. Leslie).

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

WEDNESDAY.—2.15 P.M., Dr. F. Taylor: Medicine. 2.30 P.M., Operations. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical, 11 A.M., Eye.

THURSDAY.—2.15 P.M., Dr. G. Rankin: Medicine. 2.30 P.M., Operations. 3.15 P.M., Sir W. Bennett: Surgery. 4 P.M., Mr. M. Davidson: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.

FRIDAY.—2.15 P.M., Dr. R. Bradford: Medicine. 2.30 P.M., Operations. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2.30 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.

FRIDAY—Lecture:—Dr. C. H. Wilcox: Exophthalmic Goitre.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

TUESDAY.—3 P.M., Dr. A. A. Gray: The Internal Ear of Different Animals.

FRIDAY.—9 P.M., Prof. T. E. Thorpe: The Centenary of Davy's Discovery of the Metals of the Alkalis.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.

TUESDAY.—3.30 P.M., Lecture:—Dr. Beevor: Arterial Supply to the Human Brain, with Demonstrations of Injected Specimens.

FRIDAY.—3.30 P.M., Lecture:—Dr. Beevor: Hemiplegia.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY.—4 P.M., Lecture:—Mr. W. W. James: Importance of the Care of the Teeth in Childhood.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C.

THURSDAY.—6 P.M., Lecture:—Dr. M. Dockrell: Bullous and Vesicular Eruptions: V., Herpes; VI., Zoster; VII., Dermatitis Herpetiformis.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

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Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1907, which was completed with the issue of Dec. 28th, were given in THE LANCET of Jan. 4th, 1908.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1907 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Jan. 9th, 1908.

Date.		Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Jan.	3	30·28	N.E.	...	49	34	25	...	26	Fine
"	4	30·25	N.E.	...	48	39	25	...	29	Fine
"	5	30·33	N.W.	...	30	30	26	...	26	Foggy
"	6	30·12	S.W.	...	50	50	23	39	39	Overcast
"	7	29·63	S.W.	0·01	52	51	39	48	48	Overcast
"	8	28·93	N.W.	0·95	44	44	34	37	37	Raining
"	9	29·62	N.	0·16	37	36	35	34	35	Overcast

During the week marked copies of the following newspapers have been received:—*Hertfordshire Mercury, Westminster Gazette, Tottenham and Edmonton Weekly Herald, West Sussex Gazette, Daily Dispatch (Manchester), Montreal Gazette (Canada), Dublin Daily Express, Canterbury Times, Dublin Evening Telegraph, Dundee Advertiser, Liverpool Daily Post and Mercury, Oxford Review, Daily News, Bath Herald, Yorkshire Observer, Wimbledon Gazette, Broad Arrow, &c.*

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